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JOURNAL OF DENTAL MEDICINE

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THE ARITHMETIC OF DISEASE*

E. Cheraskin, M.D., D.M.D.†

INTRODUCTION

All carefully studied natural phenomena follow mathematic laws and can be represented in equation form. This is well demonstrated by the equation for a circle or sphere and this is just as apparent from the formula for renal clearance. Strangely enough, this concept has never really been attempted with oral diseases though allusions to it appear in the literature[1, 2, 3]. An attempt will be made within these few pages to develop a concept of oral disease which can be put into formula fashion.

CHARACTERISTICS OF THE DISEASE PROCESS

There are a host of properties of disease which could be listed. However, there are two inescapable features about the disease process which are peculiarly pertinent to this discussion. They are: (1) that a pathologic process is the end product of *more than one* operating factor, and (2) that health and disease seldom, if ever, become clinically evident in pure blacks and whites. In other words, sickness and health are relative states. To pursue this color analogy, health and disease present themselves to the clinician in a series of shades of gray. Because of the paramount importance of these two features of disease, they will now be considered.

DISEASE A PRODUCT OF MULTIPLE FACTORS

The evidence for this statement is abundant from many different sources: (1) *animal studies,* (2) *the layman's observations,* (3) *the experiences of the medical practitioner,* and (4) *the observations in the average dental office.*

Animal Studies: The literature is replete with examples which underscore the point that disease is the end result of more than one factor. Two examples will be cited. First, the evidence is clear that a guinea pig can readily be made scorbutic[4]. Under these conditions, rather classic gross and microscopic changes take place. One of the rather standard observations is the extravasation of blood into the joint spaces. It is generally agreed that such hemarthrosis is due solely to the scorbutic state. But, interestingly enough, if one extremity of a scorbutic guinea pig is immobilized in a plaster cast or by bandaging, the findings are quite different[5]. In this case, the mobile limbs do indeed show the typical hemarthrosis. But bleeding into the immobilized leg cannot be demonstrated. Conversely, if a lead weight is attached to one joint or if one limb is exercised more than the others, the observations are once again quite different. In this case, the weighted or exercised limb shows more hemarthrosis than the nonweighted extremity. These extraoral experiments point up one very important item. It seems clear that hemarthrosis or no hemarthrosis is dependent upon two operating factors (Fig. 1): (1) an ascorbic acid deficiency, and (2) the presence or absence of local trauma in the form of a weight, excessive exercise, or plaster cast immobilization.

ascorbic acid deficiency	×	plaster cast immobilization	=	no hemarthrosis
ascorbic acid deficiency	×	exercise or weighting of a limb	=	hemarthrosis

(Figure 1)

The second bit of evidence deals with the oral cavity. It has been shown that there are rather well-defined periodontal alterations associated with ascorbic acid deficiency in the guinea pig[6]. It has also been clearly indicated that

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the so-called "scorbutic" changes are much greater in the presence of local chemical irritation of the gingival crevice with silver nitrate[7]. Once again, it seems very evident that more than one factor seems to be a requisite to the development of pathosis.

The Layman's Observations: The point that more than one factor operates in the causation of disease is not confined to animal studies. This concept is well-known to the man in the street. For it is a common experience for two persons, simultaneously drenched in a rain storm, subsequently to fare very differently. One of the individuals may contract a very severe upper respiratory infection, perhaps pneumonia, and may possibly even die. The other person remains unscathed. This kind of very crude observation (Fig. 2) suggests that the very same trauma, chilling, yields quite different results because of differences in people. The layman calls this *difference* by many names —notably *resistance*. Thus it is that the man on the street says, "he caught a cold because his resistance was low." Here again, we learn that disease is not the result of but one operating factor.

"resistance"	×	chilling	=	no pneumonia
lack of "resistance"	×	chilling	=	pneumonia

(Figure 2)

The Experience in Medical Practice: The point that more than one factor operates in the causation of disease is also plentifully evident in everyday medical practice (Fig. 3). For example, a seemingly healthy soul (at least free of any symptoms and signs of disease) steps out into the bright sun. Shortly thereafter, he notes a dermatitis on the dorsa of his hands. The examining physician quickly recognizes that the character and distribution of the lesions can mean but one disease—pellagra. No one will question that the patient was just as pellagrous the day before he stepped out into the sun. This story underlines the point that a suitable systemic substrate, niacin deficiency, can be present unnoticed until some type of local trauma, the sun rays, does something to yield an end-result which neither alone could have produced.

niacin deficiency	×	actinic exposure	=	pellagrous dermatitis

(Figure 3)

The Experience in Dental Practice: Examples of the interaction of local trauma and an appropriate systemic substrate are not confined to animal studies, observations by the layman, nor are they restricted to medical practice. There is very good reason to believe that these very same interrelationships are as much, if not more so, present in the oral cavity. For example, it is an everyday occurrence in the dental office to observe a patient with abundant amounts of calculus. The average dentist, by act if not by word, points out to the patient that the calculus is causing the bone loss. In other words, the practitioner might admit that what he is saying is (Fig. 4) that the local trauma, in this case the calculus, is causing the observable evidence of disease, in this instance the alveolar bone loss. In other words, a = b. Yet the very next patient might well present himself in the dental office with as much or more calculus than the preceding individual and yet with no observable alveolar bone loss. Then the following equation (Fig. 5) should

local trauma	=	observable evidence of disease
(calculus)	=	(alveolar bone loss)
a	=	b

(Figure 4)

local trauma	=	observable evidence of disease
(calculus)	=	(no alveolar bone loss)
a	=	c

(Figure 5)

be acceptable—namely, that local trauma, in the form of calculus, equals no alveolar bone loss. In other words, a = c.

If (Fig. 6) local trauma (calculus) equals observable evidence of disease, alveolar bone loss), then a = b. If local trauma (calculus) equals no alveolar bone loss, then a = c. It then follows that b = c. This is obviously ab-

local trauma (calculus)	=	observable evidence of disease (alveolar bone loss)
a	=	b
and calculus a	=	no alveolar bone loss c
then b	=	c
alveolar bone loss	=	no alveolar bone loss

(Figure 6)

surd since alveolar bone loss cannot equal no alveolar bone loss. It becomes clear, then, that the calculus, and this is but one example, cannot be considered to be the *single* cause of the disturbed bone picture. Illustrations of this same type are plentiful in everyday dental practice[8].

It would appear from these few, simple examples that the *observable* pattern of disease fits into a formula which may be expressed as follows (Fig. 7): that a suitable systemic sub-

systemic substrate	×	exciting factor	=	observable evidence of disease (symptoms and signs)

(Figure 7)

strate in combination with an appropriate exciting factor will yield observable evidence of disease as recognized clinically by way of symptoms and signs. It would follow, for stomatologic purposes (Fig. 8), that an appropriate systemic substrate acting in concert with suitable exciting *oral* factor would net observable *oral* evidence of disease—i.e., *oral* symptoms and signs.

All of the data thus far indicate an attempt to underscore the fact that a pathologic process is the result of more than one causative agent.

systemic substrate	×	exciting oral factor	=	observable oral evidence of disease (oral symptoms and signs)

(Figure 8)

The question which may still persist is why clinical (observable) proof of disease should equal the *product* rather than the *sum* of a suitable systemic substrate and an appropriate exciting factor as shown on the left side of the equation. The answer may be found by studying the examples already cited.

It should be recalled that the pellagrin was asymptomatic and free of signs until he walked out into the blazing sunlight. In other words, as long as there was no exciting agent of threshold strength, in this instance no cutaneous trauma, this variable in the equation was zero (Fig. 9). Thus, regardless of the systemic imbalance, the hyponiacinosis alone does not produce clinical proof of disease. The right side of the equation is zero.

systemic substrate	×	exciting factor	=	observable evidence of disease
niacin deficiency	×	0	=	0

(Figure 9)

It would appear logical, then, that the converse might also be true. In other words, had the patient not had aniacinosis, if this factor were now zero, then regardless of the actinic exposure, the product would again be zero (Fig. 10). There would not be the typical pellagrous dermatosis so characteristic of this nutritional deficiency state.

In the final analysis, it is rare, if not impos-

systemic substrate	×	exciting factor	=	observable evidence of disease
0	×	actinic exposure	=	0

(Figure 10)

sible, to eliminate (reduce to zero) either of the variables on the left side of the equation. This is so because disease states are not clinically observable in simple black and whites but rather in an infinite number of shades of gray —in other words, in *degrees*.

DEGREES OF DISEASE

There is no argument that an individual can be seemingly very healthy or undeniably sick. These are the blacks and whites of disease. However, too little attention is directed to the fact that there are *degrees* of sickness and well-being. In all probability, white (perfect health) is never attainable. Black, at the other pole, represents the ultimate in disease. Between these two limits is an infinite number of shades of gray—a limitless gradation of health to sickness.

This concept of degrees is not without clinical support. The clinician is constantly confronted by the patient who is clinically well today and clinically ill ten years hence. Surely the patient with diabetes mellitus, rheumatoid arthritis, ascorbic acid deficiency, to pick but a few examples, does not develop his disease overnight. But more relevant to this discussion is the individual at age 20 who has no alveolar bone loss, who continues to be well for the next 30 years, but yet, at age 50, does show severe alveolar bone degeneration. Obviously, this picture did not develop in a week, or month, or year. During the 30-year interval between white (age 20) and black (age 50), the patient cannot have been in perfect health. The question now is, "How does this new information fit into the formula?"

For illustrative purposes only, let us assign numbers to the two variables on the left side of the formula (Fig. 11). Let us simply say that there are gradations from 0 to 10. Zero, for the first variable in this scheme, indicates a perfectly healthy systemic substrate. Zero, for the second variable, signifies the complete absence of any exciting factors. Translated into a mythical situation, we are confronted with a subject who has absolutely no systemic disorder. Also, in this hypothetical case, the patient is free of calculus, there are no overhanging restorations, the occlusion is perfect. The end result is apparent—there are no observable symptoms nor signs in this perfect mouth.

systemic substrate	×	oral exciting factor	=	observable evidence of oral disease
0	×	0	=	0

(Figure 11)

On the other hand, we shall assign the value 10 to each of the two factors on the left side of the equation (Fig. 12). For example, a factor of 10 means that the patient is suffering with diabetes mellitus in its classical form with polyuria, polyphagia, polydipsia, and weight loss. A value of 10 for the second variable signifies abundant calculus, a host of ill-fitting restorations, and marked occlusal imbalance. The value on the right of the equation is high, representing the presence of many and marked symptoms and signs of disease. Thus, in the diabetic patient who meets these specifications, there are polyphagia, polyuria, polydipsia, and weight loss. In addition, there are marked gingivitis, extensive alveolar bone loss, possibly a history of slow post-extraction healing, and perhaps gingival bleeding. The clinical evidence is clear—the patient is indeed systemically ill and there are plenty of oral symptoms and signs to prove it.

systemic substrate	×	oral exciting factor	=	observable evidence of oral disease
10	×	10	=	100

(Figure 12)

The two extremes, the $0 \times 0 = 0$ and the $10 \times 10 = 100$, the whites and the blacks, are simple to comprehend. But there are many other possible combinations (Fig. 13). Equation A represents a severe diabetic patient with only minimal local (oral) irritating problems. We note on the right side of the equation the value

	systemic substrate	×	local exciting factor	=	observable evidence of oral disease
Equation "A"	severe diabetes mellitus	×	minor oral trauma		
	10	×	1	=	10
Equation "B"	mild diabetes mellitus	×	marked oral trauma		
	1	×	10	=	10

(Figure 13)

10. This means that there are some few observable symptoms and/or signs of disease. Translated into clinical terms, the 10 on the right side of equation A may represent minimal alveolar bone loss, slight gingival recession, or minimal marginal gingivitis in a *severe* diabetic patient with *minimal* oral trauma. Equation B shows the same end result, a value of 10. In this case, we are faced with a *mild* diabetic subject with *marked* local irritation.

The latter combinations thus are potentially demonstrable. However, even more often the clinician is faced with a *mild* to *moderate* diabetic patient with *mild* to *moderate* local oral trauma (Fig. 14). In clinical parlance, the

systemic substrate	×	local exciting factor	=	observable evidence of oral disease
mild to moderate diabetes	×	mild to moderate oral trauma		
5	×	5	=	25

(Figure 14)

examiner is confronted with a patient with minimal alveolar bone loss or very subtle gingivitis and/or recession who appears, for all practical purposes, to be perfectly well.

We have now established a formula for health and disease. The question which now arises is, "How does the oral cavity fit into this equation?" In order to answer this vital question, one must analyze the structure and function of the mouth.

THE ORAL CAVITY

The mouth is a most unusual area of the body. This is so because: (1) it is, in many respects, exactly *like* other regions and, at the same time, (2) it is *unlike* any other part of the body. This is true both from a *structural* and *functional* standpoint.

THE STRUCTURE OF THE ORAL CAVITY

Generally speaking, the mouth is very much like other mucosally-bounded cavities. It is lined by an epithelium much like that of the vagina, anus, and the nose. Beneath the mucosa are various types of connective tissue histologically similar to their homologues in other parts of the body. Thus, with such structural similarities, it is understandable why changes in the oral tissues parallel alteration in like tissues elsewhere in both health and disease. Herein lies the explanation for the simultaneous cyclic epithelial changes in the oral and vaginal mucosae during physiologic menstruation and the climacteric[9]. This is the basis for the similarity of the cutaneous and mucosal lesions in such disorders as intestinal polyposis[10] and Addison's disease[11].

At the same time, there are cells and tissues in the mouth which are truly unique in that they have no counterpart elsewhere. The teeth and the associated periodontal structures are the most glaring examples. The presence of the odontogenic apparatus makes the oral cavity special in two different ways: (1) problems arise in the mouth, notably caries and periodontal disease, not encountered anywhere else in the human body, and (2) the oral symptoms and signs of systemic disease states are modified by the presence of the very special cytoarchitecture of the teeth and the periodontium. Thus, simply by way of example, the oral findings of plumbism[12] and lichen planus[13] are far different from the evidences of these same diseases in the leg, or abdomen, or chest.

The discussion of the anatomy of the mouth can be simply summarized. First, the oral tissues are like their counterparts elsewhere. In other words, epithelium is still epithelium and fibrous tissue basically remains fibrous tissue.

Consequently, a so-called collagen[14] or bone disease[15] implicates the collagenous or osseous elements wherever they may be. And so, understandably, systemic diseases do have their oral reflections. But, secondly, the oral tisues are in some anatomic respects quite unique. Hence, problems arise in the mouth which are not encountered elsewhere. Thus it is that the filiform papillae of the tongue atrophy in various nutritional disorders[16]. So it is that the teeth become subclinically more mobile during the pregnancy state[17].

THE FUNCTION OF THE ORAL CAVITY

Not only is the mouth *structurally* like and unlike similar cavities, but it is also *functionally* like and unlike other mucosal zones. The similarities require little elaboration. What are more important are the differences—the unusual functional demands placed upon the oral tissues.

The mouth, it should be recalled, is expected to participate in a host of vital functions, notably speech and mastication. Within the very same breath, literally, the oral mucosa is required to tolerate high (boiling coffee) and low (freezing ice cream) temperatures. No other tissue of the body is asked to withstand such repeated insult. It is of parenthetic interest, when one conducts a similar experiment upon the supposedly tougher skin, that an erythema results. Yet the mouth is expected, and does indeed, handle such microtraumata exceedingly well. *The oral tissues, it must be emphasized, can only weather such persistent local irritation as long as the systemic substrate is in good health.* This last point bears directly on the present discussion of a formula for disease.

We have already observed that the *product* of a systemic substrate and a suitable exciting oral factor yields observable oral evidence of disease. Now one can add that, under so-called physiologic conditions, oral irritation is high. Thus, in the formula one can say that local trauma is customarily assigned a value of 3, or 4, or 5 or more. It then becomes clear that the higher the value on the left side of the equation, the greater will be the product of the two variables on that side.

THE FORMULA OF DISEASE

The equation which has just been developed suffers from one very great fault, its oversimplification. It implies that there are but two variables (systemic substrate and exciting factor). It suggests, to pursue the example, that a patient must be diabetic and must, in addition, have calculus. Actually, each of these factors in the equation may indeed be a host of variables (Fig. 15). Is it not conceivable that a patient, in the climacteric, may be a very mild diabetic suffering with early rheumatoid arthritis complicated by a marginal ascorbic acid deficiency? Is it not further possible that there may be a slight collection of calculus, imperceptible overhanging restoration(s), and mini-

systemic substrate $(a+b+c+d \ldots m)$			exciting oral factors $(p+q+r+s+t+u \ldots x)$			observable evidence of disease
a = mild diabetes mellitus	= 2	×	p = moderate calculus deposition	= 2	=	
b = early rheumatoid arthritis	= 2		q = imperceptible overhanging filling materials	= 2		
c = marginal ascorbic acid deficiency	= 2		r = occlusal imbalance	= 1		
d = mild climacteric	= 2		s = tobacco irritation	= 1		
			t = bruxism	= 2		
			u = vigorous toothbrushing	= 2		
	8	×		10	=	80

(Figure 15)

mal occlusal imbalance in an individual who smokes just a little bit too much, who grinds his teeth while asleep, and who brushes his teeth a bit too enthusiastically? Thus, in the formula (Fig. 15), *a* might well represent mild diabetes mellitus valued at two, *b* early rheumatoid arthritis, *c* marginal ascorbic acid deficiency, and *d* mild climacteric, with possibly other pathologic problems up to *m*. At the same time, *p* signifies minimal calculus deposition, *q* imperceptible overhanging filling materials, *r* occlusal imbalance, *s* tobacco irritation, *t* bruxism, *u* vigorous toothbrushing, and other local irritating factors up to *x*. It would appear that, actually, this is usually the state of affairs. In other words, the individual at 20 with alveolar bone loss is probably suffering with some of these disorders in their mildest forms. Hence, he remains presumably well, though at age 50 he does indeed display severe alveolar bone degeneration. Perhaps, here is the explanation for so-called *idiopathic* periodontal disease.

This equation also allows the opportunity to consider what the practitioner actually does when he *treats* and *cures* a particular problem. Assuming this equation to be correct, it then follows that the dentist is dedicated to reducing the numbers in both variables on the left side of the equation (Fig. 16). For example, in this particular patient, it is possible to correct the diet and better control the diabetic state, administer the adrenocortical hormones, supply ascorbic acid supplementation, and possibly even estrogen therapy. If one could do just this so that each of the assigned numbers were reduced from 2 to 1 then the sum of the far column would be 4 instead of 8. Thus, even without any oral therapy, the product would be 40 instead of 80. Accordingly, the oral symptoms and signs would decrease considerably. In other words, the oral cavity would be improved. If one could then add oral therapy the situation would become even more favorable (Fig. 17). For example, calculus could be eliminated. One must question whether it could be eliminated entirely to reduce this factor to zero. But even if the twos in the second column could be reduced to ones and tobacco eliminated, the sum of these operating factors would be reduced from 10 to 5. This means that $4 \times 5 = 20$. Once again, the number on the right diminishes and the mouth shows even fewer symptoms and signs. The point being made is that this equation underscores the purpose of therapy—namely to reduce all of these values to as close to zero as possible.

Thus far, the discusion has been largely *philosophic* in that a concept of disease, certainly not a new one, has been analyzed. An attempt has been made to make this concept more "real" with *mathematic* overtones. But the final test would be to list and discuss the 200 or so systemic disorders and to consider the interplay of systemic with all of the known local oral irritating problems. Obviously, this is impossible because: (1) of time limitations, and,

systemic substrate $(a+b+c+d \ldots m)$		$\times$	exciting oral factors $(p+q+r+s+t+u \ldots x)$		=	observable evidence of disease
a = mild diabetes mellitus	= 1		p = moderate calculus deposition	= 2		
b = early rheumatoid arthritis	= 1		q = imperceptible overhanging filling materials	= 2		
c = marginal ascorbic acid deficiency	= 1		r = occlusal imbalance	= 1		
d = mild climacteric	= 1		s = tobacco irritation	= 1		
			t = bruxism	= 2		
			u = vigorous toothbrushing	= 2		
	4	$\times$		10	=	40

(Figure 16)

systemic substrate			×	exciting oral factors			=	observable evidence of disease
$(a+b+c+d \ldots m)$				$(p+q+r+s+t+u \ldots x)$				
a = mild diabetes mellitus	=	1		p = moderate calculus deposition	=	1		
b = early rheumatoid arthritis	=	1		q = imperceptible overhanging filling materials	=	1		
c= marginal ascorbic acid deficiency	=	1		r = occlusal imbalance	=	1		
d = mild climacteric	=	1		s = tobacco irritation	=	0		
				t = bruxism	=	1		
				u = vigorous toothbrushing	=	1		
		4	×			5	=	20

(Figure 17)

more important, (2) much information is still lacking about these systemic diseases and even more data are needed regarding the interaction of systemic and local factors. It is, however, possible to show, by *example,* how the formula applies to a specific clinical problem.

CASE REPORT

This particular case is included for several reasons: (1) it is a common problem in the average dental office, (2) the solution, at first glance, is simple, and (3) the story provides the rare opportunity to observe, almost *in vitro,* the interplay of local and systemic factors by modifying these two variables independently.

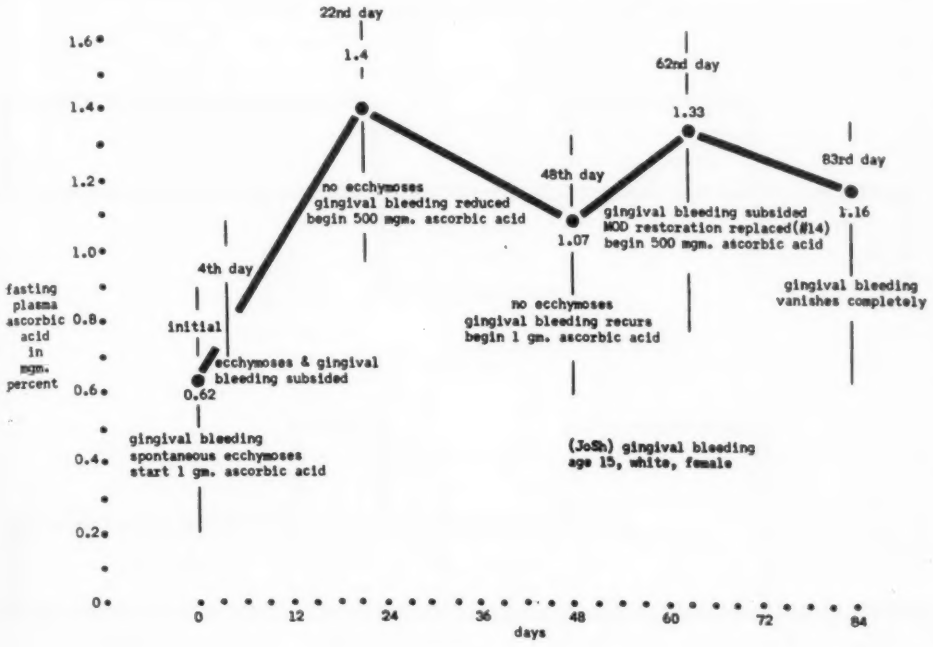
A 15-year-old female was first observed in the dental clinic with a very simple and easily demonstrable complaint — gingival bleeding from the embrasure between the left maxillary premolar and the first molar precipitated by toothbrushing. This is the kind of observation which can be confirmed or negated simply by having the patient brush her teeth in the presence of the examiner. Oral examination proved negative (Fig. 18) except for an ill-fitting MOD amalgam restoration in the first molar with a moderate overhanging margin. Once again, the problem appears to be quite simple (Fig. 19). The local mechanism trauma due to the combination of toothbrushing and the ill-fitting restoration appears to be causing the observable gingival bleeding. The usual procedure in the average dental office is to recommend replacement of the MOD restoration. Implied in this type of thinking is that the local trauma is the cause of the gingival bleeding.

(Figure 18)

The only other findings of importance were seemingly spontaneous ecchymoses of the skin —incidentally, a very common observation particularly in the female—and a very poor history of citrus intake—also a very common finding

toothbrushing	+	local trauma in the embrasure due to an overhanging restoration	=	gingival bleeding

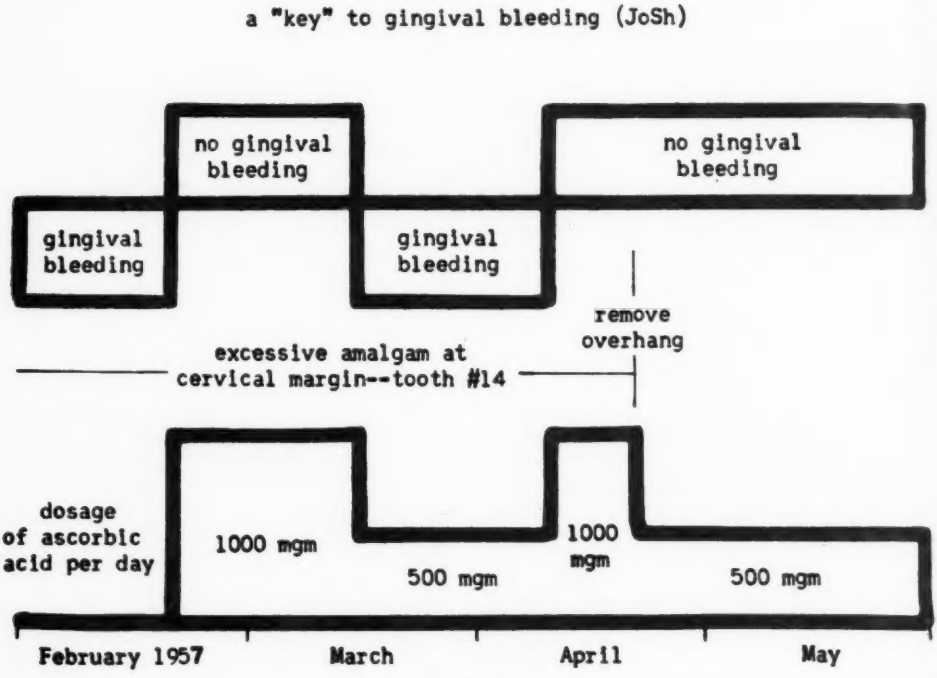
(Figure 19)



(Figure 20)

in about 30 to 40 percent of the population[18]. The initial fasting plasma ascorbic acid level proved to be a marginal .62 mgm. percent (Fig. 20).

The patient was started on a daily regime of 1 gram of ascorbic acid by mouth in divided doses (250 mgm. four times a day). When seen four days later, she reported that both the *ecchymoses and the gingival bleeding had subsided.* It is important to point out that the toothbrushing habit was unchanged and the ill-fitting restoration still present. All that had been done was to decrease capillary fragility. However, the ascorbic acid regime was continued. On the 22nd day, there were no ecchymoses and reduced, but not absent, gingival bleeding. The fasting plasma ascorbic acid level was then 1.4 mgm. percent (roughly more than twice that on admission). Because of the interesting clinical course, the ascorbic acid dosage was halved—the patient told to take 500 mgm. ascorbic acid daily. When observed about three weeks later, on the 48th day, the gingival bleeding but not the ecchymoses had reappeared while the plasma ascorbic acid level had declined to 1.07 mgm. percent. The 1 gram per day ascorbic acid regime was instituted. Two weeks later, on the 62nd day, the plasma level had risen to 1.33 mgm. percent. Most interestingly, the gingival bleeding had once again subsided. This time the dosage was again halved at the same time that the ill-fitting restoration was replaced with a more acceptable one. The fasting plasma ascorbic acid level at the next visit, three weeks later on the 83rd day, was 1.16 mgm. percent. *The patient reported that the gingival bleeding had now vanished completely.*



(Figure 21)

This case emphasizes very well the delicate interplay of systemic and local factors (Fig. 21). One can pictorially describe the relationship much like a "key" fitting a lock. Here is a child obviously suffering with a mild ascorbic acid deficiency as evidenced by the spontaneous cutaneous ecchymoses even if one wishes to explain away the gingival bleeding on purely local factors. However, the same increased capillary fragility and permeability which produced ecchymoses might well have contributed to the gingival bleeding with toothbrushing. This seems a likely explanation since decreasing capillary fragility (without local treatment) by means of ascorbic acid caused the disappearance of the ecchymoses and a reduction in gingival bleeding. This can be applied to the formula (Fig. 22). The mild to moderate vitamin C deficiency (arbitrarily assigned a value of 5) in combination with mild to moderate local trauma (also assigned the number 5) produced moderate gingival bleeding as indicated by the 25 in the right side of the equation. When the ascorbic acid status was improved

ascorbic acid deficiency	×	local trauma	=	moderate gingival bleeding
5	×	5	=	25

(Figure 22)

improved ascorbic acid state	×	local trauma	=	slight gingival bleeding
1	×	5	=	5

(Figure 23)

improved ascorbic acid status	×	reduced local trauma	=	no macroscopic bleeding
1	×	1	=	1

(Figure 24)

(Fig. 23) by reducing the value, let us say from 5 to 1, the product yielded reduced gingival bleeding. However, when both the hypovitaminosis and the overhanging restoration were corrected (Fig. 24), the bleeding disappeared, at least macroscopically.

SUMMARY

1. An attempt has been made to show, in simple arithmetic fashion, that the observable oral evidence of disease is the product of more than one operating factor.

2. Since oral trauma, even under physiologic conditions, is quite high, the product of it and even a marginal systemic imbalance may be critical enough to net oral symptoms and/or signs.

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LE ARITHMETICA DE MALADIA

per Dr. med. e med. dent. E. Cheraskin

SUMMARIO IN INTERLINGUA

Omne cautemente studiate phenomenos natural es representabile in le forma de equationes mathematic. Iste facto es ben illustrate per le equation pro un circulo o un sphera e es equalmente apparente in le formula pro le clearance renal. Il es estranie que iste conception ha nunquam essite applicate al morbos oral, ben que allusiones a illo se trova in le litteratura.[1, 2, 3]

Il existe un grande numero de proprietates de morbos que poterea esser listate in iste connexion. Tamen, duo aspectos particular del processo pathologic es inescappabilemente pertinente ab le presente puncto de vista. Illos es (1) que un processo pathologic es le producto final de

plus que un factor contributori e (2) que sanitate e maladia—rarmente, si unquam—se presenta in clar contrastos clinic de nigre e blanc. In altere parolas, maladia e sanitate es statos relative. Pro exploitar nostre analogia de colores un pauco plus, sanitate e maladia se presenta al clinico in un serie de nuances de gris.

Le supporto pro iste assertiones es abundante in varie areas, i.e. (1) in studios experimental con animales, (2) in le observationes del laicos, (3) in le experientia del medico practic, e (4) in le observationes in le typic practica dental.

Es demonstrate, per simple medios arithmetic, que le observabile manifestationes de pathologia oral es le producto de plus que un factor contributori.

Viste que le trauma oral, mesmo sub conditiones physiologic, es satis pronunciate, su effectos —e mesmo un marginal imbalancia systemic—pote esser satis critic pro resultar in signos e/o symptomas oral.

PREPARATORY MEDICATION FOR THE DENTAL PATIENT*

Don Chalmers Lyons, D.D.S., M.S., Ph.D.

Adequate preparation of the dental patient for either reconstructive or surgical treatment should always include a comprehensive study of the patient's underlying general health, the present oral condition, and the proposed method of correction. The extent of this examination will vary with the dentist's objective in treatment planning.

The development of the case history can be very inclusive or relatively simple. As one extreme, a check list type of physical history such as that used by the dental department of the University of Pennsylvania can be used. This contains 80 questions regarding the patient's health and dental experience, thus giving a broad basis for the dentist's treatment planning. Although such an extensive questionnaire may be impractical in the average dental practice, a recent editorial in the Journal of the American Dental Association[31] states that the dentist's responsibility of determining the state of health of his patient must not be considered lightly, and he should have an adequate history as a background for his contemplated treatments.

In general the following eight questions, three of which are suggested by Simon[26], and three by Ostrander[21] could be used in general practice. Their answers will indicate the patient's experience status, whether a more extensive health examination should be requested and if a consultation with the patient's family physician is needed. These questions are:

1. Are you at present under the care of a physician?
2. What medicine or medicines are you now taking?
3. When did you have your last physical check-up?
4. Are you sensitive to novacaine or other injections?
5. Are you allergic to antibiotics or similar drugs?
6. Do you get unusual reactions to sedatives?

If the patient is one where surgery is contemplated two more questions might be asked. particularily if the patient is a referred case,

7. Who are your family dentist and family physician and when did you last visit them?
8. Do you bleed profusely or longer than you think usual when you have a tooth extracted or at other times?

There are probably many other questions of a similar nature which suggest themselves to the individual dentist, never forgetting that the unusual can always happen. Cullen and Gross[3] in their textbook suggest that one must always approach a patient who has a known disorder with an open mind regarding that disorder, remembering that the patient may be subject to other disorders not necessarily associated with the known disease. The patient who is under a continuous medical treatment presents added responsibilities to the dentist. For example it is well known that patient's undergoing cortisone treatment, patients continually using reserpine or rauwolfia for hypertension, and the patient who is using certain drugs to thin the blood where there has been cerebral difficulties, present complications in treatment planning. Some of the continuing medication treatments complicate the use of sedatives. Shapiro and Teng[24] report that while the depressor effect of R.serpentina while limited is still slightly more potent than phenobarbitol. This suggests that if more sedation was prescribed an unexpected depth of sedation might be the end result.

The answers to the above questions, plus an evaluation of individual tensions, anxiety, mood, attitude towards dental treatment as controlled

* Presented before the Montreal Section of the American Academy of Dental Medicine, September 27, 1958, Montreal, Canada.

by the physical and mental condition of the patient, will indicate the type of preparatory medication needed.

MEDICATION

Medication, *when indicated,* is based on diagnosis of need. In routine practice primary consideration is probably to be given to correcting tensions, anxiety, apprehensions, or perhaps one might say, just plain everyday fear of dental treatment. Unfortunately, many dentists refuse to recognize that this is a real entity to many potential patients, and very important to them. Huxley[12] is of the opinion that the sick are aware of only one thing, their private pains and miseries. From a practical viewpoint it is almost impossible to distinguish between organic and psychogenic pain. The response to pain instigators vary tremenduously in individuals, usually conditioned by previously conditioned experiences and to a lesser degree by environmental influences. It is often the determinate as to whether adequate dental restorative treatment can be attained. However, control of pain, real or imagined, should not be attained by medication as a routine procedure when sympathetic understanding can produce equal end results.

We have an extensive choice of preparatory medications. They may be divided into the following catagories: sedatives, anxiety-apprehension control and mood amelioration agents, control of allergies and toxicity to drugs, control of infections, anti-sedation agents, anti-edema control, hemorrhage prevention and control, anti-convulsants, central nervous system stimulants, and others which might occasionally be used for emergencies such as the cardiovascular medications.

The sedatives or central nervous system depressants used are prescribed according to necessity based on the treatment planned. Therefore one must immediately decide whether the case requires sleep without depression, if complete physical relaxation (to semiconsciousness) without excitation is needed, if the treatment plan calls for only daytime sedation, and finally to accomplish the desired state, does the patient need an agent of long or short duration. We use the term sedation in the broad sense realizing that we might break it up into such values as hypnotics, analgesics, narcotics, etc.

Many times patients state that the sedative prescribed only lasts for an hour or two and has left them with more pain than before. Need for sedation must be evaluated to its fullest extent for such prescriptions defeat the purpose for which they are given. When narcotics such as morphine, codeine, demerol etc., are desired to potentiate sedatives they should be given. Duration and timing of administration are very important factors in sedation.

A concomitant group includes those drugs which may be used to augment calmness, reduce insomnia associated with irritating persistant pain, or prevent mental depression of the same origin. Control with the use of tranquillizers may be considered, but they can not be expected to produce more than a potentiating euphoria.

The sedating agents required may include the triple barbiturates such as represented by the combining of sodium secobarbital, sodium butabarbital, and phenobarbital (Ethobral). Dosage: 1 gr. given twice daily for daytime sedation, 2 gr. at bedtime for sleep. When a quick acting sedative is desired which is to last from four to six hours, sodium seconal is usually precribed. Dosage 1½ to 3 gr. given one hour before the dental appointment. Some dentists add half the initial dose when the appointment is lengthy after they have been treating the patient for at least a half hour. Others increase the initial dosage at subsequent appointments. Sodium butabarbital is also fast acting, and will produce the desired reaction in about thirty minutes which makes it particularily adaptable for office use for the patient who fears the prick of a needle when a local anesthetic is used, or the twinge of pain which might be attendant to scaling of teeth. Suggested dosage: ½ to 1½ gr. as needed.

Sodium pentobarbital (Nembutal) is available in a number of combinations. Examples are: combined with asperin 5 gr., with belladonna 1/6 gr., with ephedrin 3/8 gr., and many others. It is available in the elixir form for children,

but one must remember that one teaspoonful contains only ¼ gr. so that in order to get a sufficient dose for any one except the very youngest of patients many table spoonfuls would be needed. Glutelthidime (Doriden) may be used as a longer acting analgesia where the 'breaking in' of a new denture is a pain problem. Hydrocortisone, (Lyons[18]) or a benzocaine ointment locally often limits the need for unnecessary immediate corrections to the denture margins.

There is frequently need for the use of a sedative to be given prior to the injection of local anesthetics in order to prevent tremors, side reactions of respiratory distress, fainting etc., and to augment the effect of the anesthetic. Many dentists advise this as a routine procedure. Any of the barbiturates such as sodium seconal may be used and given an hour prior to dental treatment. Dosage: ¾ to 1½ gr.

There is an increased tendency to administer one of the tranquillizing drugs twenty four to forty eight hours prior to the dental appointment. They may be of some value as relaxants, or to potentiate other drugs, but their routine use is questioned. Mephenesin, proclorperazine, and others are available in various forms. In combination with dexedrine (dextropamphetamine sulfate) which is a standard antidepressant, they may add to the smoothness of the anesthesia. Examples: Thorodex, (thorozine 10 mg. and dexedrine 2 mg.). These procedures are of special value in the treatment of the mentally retarded, spastic patients etc.

IMPROVE PATIENT REACTION

A number of adjuncts are suggested to improve patient reaction and anesthetic course when a general anesthesic is used, whether it be by inhalation, intravenous, or a combination of the two. Complete muscular relaxation is obtained in two minutes by the use of succinycholine. Dosage: Single dose or drip, 2 to 3 mg. per minute. Another quick acting agent which is useful is nisenuit hydrochloride (dl-alpha-1,3,dimethyl-4-phenyl-4 propionic piperidine hydrochloride). It is administered as a subcutaneous injection of 40 to 60 mg. and takes effect in about 5 minutes. Curare is also used in many instances.

The reactions of sore throat and hoarseness often noted when endotrachael intubation is used can be reduced by (1) adequate relaxation of the muscles of the throat with the proper medication and (2) addition of one of the anti-inflammatory drugs given prior to the anesthesia. Example: Metreton (2.5 mg. prednisone, 2 mg. chlorprophenpyridamine maleate, and 75 mg. ascorbic acid.) Dosage: one tablet three times daily for twenty four hours pre-op., and then three times daily for at least twenty four hours afterward. Coughing and hiccoughing, "bucking" as the anesthesiologists call it, can be diminished by adequate muscle relaxation of the throat with succinycholine plus preoperative use of one of the tranquillizing drugs which produce a relaxing effect such as one of the mephenesins.

The increased use of the intravenous anesthetic in office practice emphasizes the need for the use of a quick recovery adjunct from the narcosis. There are a number of drugs available which will hasten the return of consciousness. Levallorphan tartrate increases respiratory rate and volume exchange, and is a narcotic antagonist without interfering with pain relieving agents. Lorphan Dosage: 2 to 4 mg. or (Ritalin) methylphenidate hydrochloride shortens the recovery time. Dosage: 10 to 30 mg. is given either intravenously or intramuscularily. It is both a stimulant and analeptic and is frequently given at the end of an intravenous anesthesia before the needle is withdrawn from the vein. There are many others which produce equal results, but the final choice of these agents should be made with appreciation of the fact that they may produce an euphoria which makes it undesirable to permit the patient to leave the office unaccompanied or drive a car for a number of hours afterwards. It is particularly advisable to tell the patient what to expect in the way of sedation, and especially so when the patient is a child. Then the parents should be told how long to expect sedation, euphoria etc., in their child.

ALLAYING OF TENSIONS

Another important phase of the preparation of the dental patient is the importance of allaying their tensions, fears, and improving their spontaneous cooperation. Only when diagnosis of existing physical or mental conditions indicate the need should the anxiety-apprehension control agents be used. Since they are also muscle relaxants they may be used as adjuncts in the treatment of temporo-mandibular joint pains due to ligament strain, in the prevention of nausea, reduction of gag reflex, and to lessen excitation in children. (Nowlis and Nowlis,[19] Faucett.[6]) It is realized that this type of patient might also be considered as an ideal subject for the use of hypnodontics, for there are usually additional problems of unnatural emotional defences to combat, conversion neurosis, and an inability to relax under normal stimulus.

Prolonged relaxation without euphoria is needed in this type of case. In the average dental practice such drugs as meprobamate, mephenesin, promazine, proclorperazine, and others of a similar nature may be used. (Berger.[2]) Meprobamate is an inter-neuron blocking agent with a slightly longer muscle relaxing action than the mephenesins. Promazine produces more relaxation than some of the others. Sleeping habits are improved by all. These drugs produce ataraxia or a detached serenity without clouding consciousness or depression of mental facilities. Patients who really need this type of medication become quieter and more cooperative very quickly. (Domino,[5] King et al.[14-15]) This medication is indicated in the treatment of many female patients who are in the immediate pre or post menopausal state for they may complain without apparent cause of really minor irritations, oral tissue reactions, denture fit etc., that are not clinically diagnosable.

A small percent, about 6% of the patients complain of a mild drowsiness and other side reactions but these usually appear only after prolonged administration of the drugs and are not applicable to dental medication procedures. It is also of interest to the dentist that these agents depress the linguo-mandibular reflex (Osinski,[20] Wennersten,[29] and Hoffman.[11])

Gillette[9, 10] finds that meprobamate has more effect in cerebral palsied patients than mephenesin. Litchfield[17] also states that meprobamate is very effective in treating irritability, sleeplessness, and restlessness in the mentally retarded or physically handicapped child who is able to behave in a normal manner only when relaxed. These drugs are therefore of great benefit to the dentist in his problem of giving adequate treatment of a restorative nature to the child having convulsive muscular movements.

Suggested dosage: meprobamate, 1 tablet (400 mg). three or four times daily and a fourth (fifth) at bedtime over a 24-48 hour period before the projected treatment, unless already under protracted treatment with these agents. Proclorperazine is given orally in 10-25 mg. doses every four to six hours. This drug can also be injected intramuscularily in the proper form and is also available in syrup. Dosage: one to two teaspoonfuls (5-10 mg.) every four to six hours. (Weir and Anderson,[30] Young and Kingsbury.[28]) Compazine (Thorazine) and other tranquillizers are now available in spansules (sustained release capsules with a 10 to 12 hour therapeutic dose). Trade preparations include: Equanil, Miltown, Campazine, Atarax, Thorazine, Sparine, Sterotril, and others.

Mood ameliorants have three distinct uses in dental preparatory medication. They are of value in alleviating mental depression from barbiturate sedation by limiting the action of sedatives, they accelerate the return of alertness after general anesthesia, and they may be used to counteract the anti-histamines. (Huxley,[12] Nowlis et al.[19])

The drugs include a choice of the following: Metrazol, which is primarily used as a cardiac and respiratory stimulant where prompt action is required, for it stimulates the whole central nervous system. It is of value in the treatment of cardiovascular collapse, in cases of shock, and of depression due to drugs. Dosage: 0.1 to 0.3 gm. (1½ to 4½ gr.) and repeated as required. Caffeine sodium benzoate is also used. Dosage: orally 5 gr., hypodermically 3 to 5 gr. Mephentermine sulfate (Wyamine) may be used when a prolonged effect is desired. Dos-

age: 6.25 to 50 mg. daily, in one or two doses. It should be given one hour pre-op for adequate effect, and one should not prescribe it for use after 4 p.m. for then the drug will interfere with sleep that evening.

PREVENT ALLERGIC REACTIONS

A very important part of the preparatory treatment of the dental patient is to be alerted to the possibility of allergic reactions of any type and to prevent them. This item should always be a part of the history and preliminary examination. This type of reaction includes toxicity to various drugs, antibiotics, local and topical anesthetics, sedatives, narcotics, bacteria, molds, fungae, virus toxins, antiseptic agents, dental impression compounds, waxes, denture acrylics, tooth pastes, mouth washes, lip sticks, and an almost endless list of occasional ones.

In general, the antihistamines will control or limit the reactions. The antihistamines by themselves have little pharmacologic activity and in therapeutic doses do not significantly effect the normal organism. They act only under pathologic conditions when histamines have been released. (Silverman,[25] Sanders.[23]) Baldridge[1] noted in his control cases that healing takes 11.3 days, but when 0.4 mg. pyrobutamine was administered pre-op and 0.8 mg. post-op, healing took place in 8.5 days. When the drug was administered only postoperatively he reports that it took 11.25 days for healing, or compared with the controls, no effect at all.

The allergic responses to penicillin are in a group by themselves. It has been stated that 5% of those receiving this antibiotic have some sort of reaction. Penicillinase, an enzyme developed by Bacillus cereus, catalysizes hydrolysed penicillin to penicilloic acid which is a non-allergen. Penicillinase is available as (Neutraphen). Dosage: 800,000 units given as a single dose, lasting up to six days. It can be repeated at three or four day intervals if needed. Antihistamines should be administered concomitantly. In cases of anaphylactic shock both should be given intravenously as quickly as possible.

Among the available antihistamines are the following drugs: Promethazine hydrochloride with the dosage of 25 mg. given orally the evening before or one to two c.c. of the injectable form (the equivalent of 25-50 mg.) given immediately before the dental appointment. Diphenhydramine hydrochloride (Benedryl), prophenpyridamine (Trimeton), thonzylamine hydrochloride, chlorothem citrate, pyrobutamine compound (Co-Pyronil) and many others can be used with equal efficiency. Many of them can be obtained in the form of suspensions or syrups for children, dosage depending upon weight.

PREVENTION OF INFECTION

The elimination or prevention of infection is a very important item in preparatory medication. Our choice of drugs is very extensive, but the antibiotics and the sulfas are most widely used today. Treatment is now based on the use of substances which inhibit bacterial growth or destroy the chemical contents of the bacterial cell. Because bacteria rather quickly develops a resistance to these anti-infectives, procedures and agents must be changed from time to time. It is not wise to depend upon one type of antibiotic or sulfa but be prepared to make a change when necessary. There are a number of rather easy tests which can be used; the paper disk method of determining sensitivity for example. Another important factor to consider is allergic response. This can be determined from the patient's history or a simple patch test on the arm when there is any question of possibility. Patients may be sensitive to both the antibiotics and the sulfas, but in such cases a patch test will tell which must be eliminated or can be used. In case of real necessity it may be necessary to administer an antihistamine concomitantly.

As a prophylaxis against spread of infection we may prescribe antibiotics in the injectable form or administer them orally, the amount and type depending to a great extent on how important it is to raise the blood level quickly and maintain it as long as needed. This is especially important when the history reveals preoperative conditions indicating particular need

for such protection as in cases of rheumatic fever, heart damage etc. Our choice is a wide one for the penicillins, tetracyclines, streptomycin, mysteclin and others are available in many forms. The only problem is to give a large enough initial dose to be effective. It is now suggested that the initial dose of penicillin be at least 600,000 units and 1,200,000 is advised. The tetracyclines should be started with at least 500 to 1000 mg. and then 250 mg. every 6 to 12 hrs.

There is a definite place for the sulfas in the dental practice. They are usually used with the antibiotics and in combinations such as the triple sulfas: sulfadiazine, sulfamerazine, and sulfamethazine. Suggested dosage: 15 gr. initially and then 7.5 gr. every four hours as needed.

The control of edema which develops as a postoperative swelling of tisues is important, especially that which develops following root resection, removal of impacted teeth, cysts, trauma, fractures, and the acute cellulitis of infection. Control can be of a real service to the patient in the cases of immediate denture placement, for it may be difficult to convince the patient that the 'cutting in' is due to the operative procedure and not the fit of the dentures.

The use of the tissue penetrating agents such as, hyaluronidase, to control edema has opened a new avenue of preparatory medication. It makes possible a wider spread of local anesthetics by increasing the permeability of tissues, this in turn facilitates the flow of intercellular fluid, thus promoting diffusion and absorption. Hyaluronidase has been used with fibrinolysin to increase the healing potentials of chronically infected tissues. Many oral surgeons use the agent routinely in all extractions. One must not forget however, that it may also permit wider and faster spread of infective bacteria so an adequate level of antibiotics must be maintained.

Suggested agents include stabilized hyaluronidase (Wydase), chlorprophenpyridamine maleate (Chlor-trimeton) and others. Ten to 150 units of the agent is usually mixed with the local anesthetic in the following manner and injected at the same time. Withdraw 0.1 to 0.2 c.c. from the cartridge of the local anesthetic and replace with the same amount of this drug. This is the equivalent of 15 to 30 U.S.P. units. To hasten termination of the anesthetic after surgery 50 to 150 units may be injected. The combined action of an anti-inflammatory agent, antihistamine, and anti-allergin is available in the oral form as (Metreton). Dosage: one to two tablets at mealtime and before bed, as needed. Contraindications are: active and questionably healed tuberculosis, psychotic states, ulcers, herpes simplex, hypertension, osteoporosis, and renal insufficiency.

HEMORRHAGE PREVENTION MEASURES

Preventive medication is not complete without giving consideration to the prevention of hemorrhage or excessive bleeding. The mechanism of blood clotting is well established although there is still unknowns which add complicating factors. (Ferguson.[7]) When the history indicates it, the pre-op examination and preparatory procedures should include a bleeding and clotting time, plasma coagulation, platelet count, hemoglobin percentage, red and white cell count, Rh factors, cross matching, and study of the fractions of thrombin, thromboplasm, etc. The complicating items of hyperemic gingival tissues, hypertropic tissues in cases where dilantin is being prescribed as a continuous anti-convulsive medication, pregnancy gingivitis, local infections, systemic diseases such as diabetes, blood diseases such a leukemia, hemophelia, polycythemia, etc., always influence hemorrhage possibilities. Previous long time administration of antibiotics which interfere with bacterial growth in the intestines and vitamin K proliferation in turn interferes with prothrombin activity must be considered. (Flenchaus.[8])

Many of the dental patients today have had previous cerebral accidents and are on some type of anti-coagulant therapy using such drugs as coumarin. There is some disagreement as to pre-operative measures necessary, for the possibility of hemorrhage in these cases is very high. There are reports in the literature of continued

excessive bleeding for several days until the anti-coagulant was discontinued. The internist is also in disagreement as to the dangers of discontinuing their medication for even a short period of time. Therefore when the history tells that the patient is under such a medication, a consultation with the patient's specialist is in order and extractions carried out with the utmost care.

We divide our hemorrhage prevention measures according to: (1) need in known cases of bleeders, history of excessive bleeding, and those on anti-coagulation therapy; (2) where there is spongy inflammed gingival tissues of any origin; (3) and where there is a history or complicating systemic disease.

The choice of preventive medications in these cases is still more or les theoretical. Vitamin K (Synkavite, Hykanin, Thyokay) is commonly used where improvement in the prothrombin time is indicated. Five mg. in form of tablets or capsules are prescribed for several days to a week previous to the appointment along with the addition of increased amount of daily intake of vitamin C, 100-250 mg. daily, to improve capillary tone. One c.c. of vitamin K (5-10 mg.) is injected intramuscularly just prior to the dental appointment. Another agent which is finding increased use is citrus-bioflavonoid compound. This is prescribed daily for at least three days prior to the dental appointment. Dosage: 2-3 capsules daily (100 mg. bio-flavonoid with 100 mg. vitamin C). Rutin is also of value: 20/100 to 60/100 mg. rutin and ascorbic acid daily. Adrenosem salicylate may be used: Dosage 2.5 mg. three times daily for several days prior to the appointment. One cc. is injected at time of surgery. (Riddle.[22]) Complete blood studies of the component fractions when indicated will add to the preparatory medications which can be used to prevent hemorrhage.

While it is not probable that an anticonvulsant will be needed very often as a preparatory medication, the dentist should be prepared with phenobarbital for this eventuality. Daly,[4] Jenny and Pfeiffer[13] discuss the present types of medication used and conclude that the ideal agent without side effects has not been attained, nor has anything supplanted this barbiturate.

CONCLUSIONS

There are many instances in the average dental practice where an adequate preparatory history indicates the need for medication to make the dental treatment smoother, more satisfactory to the patient and the dentist, and avoid the office emergencies which are preventable. There is a wide choice of such medications. No effort is made here to recommend any single drug for any particular case. The dentist should make his own selection based on what he finds most effective according to the treatment planned.

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MEDICATION PREPARATORI PRO LE PATIENTE DENTAL

per Dr. chir. dent. e phil. Don Chalmers (M.S.)

SUMMARIO IN INTERLINGUA

Le adequate preparation del patiente dental pro le tractamento reconstructori o chirurgic deberea includer in omne casos un studio comprehensive del subjacente stato general de sanitate in le patiente individual, de su presente condition oral, e del proponite methodo de correction. Le extension de iste studio varia naturalmente con le objectivo al qual le dentista aspira in planar su tractamento.

A generalmente parlar, le sequente octo questiones pote esser usate in le practica routinari. Le responsas offerite per le patiente a ille questiones indica le stato de su previe experientias e si o non un extense examine del stato general de sanitate in le patiente deberea esser requirite e si o non un consultation con le medico de familia del patiente es indicate. Le questiones es le sequentes:

1. Es vos currentemente sub le tractamento de un medico?
2. Qual medicina o medicinas prende vos currentemente?
3. Quando habeva vos vostre ultime examine physic?
4. Es vos sensibile pro novocaina o altere injectiones?
5. Es vos allergic contra antibioticos o simile drogas?
6. Ha vos reactiones inusual a sedativos?

Si le caso del patiente es un in que chirurgia debe esser prendite in consideration, duo questiones additional debe esser presentate. Isto vale specialmente si le patiente se presenta secundo le recommendation de un altere doctor.

7. Qui es vostre dentista e vostre medico de familia e quando ha vos visitate les le plus recentemente?

8. Experientia vos sanguinationes profuse o plus prolongate que lo que vos considera como usual quando vos ha un extraction de dente o a altere occasiones?

Il existe multe casos in le typic practica dental ubi un adequate historia preparatori indica le desirabilitate del uso de medicamentos pro render le tractamento dental plus lisie e plus satisfacente ab le puncto de vista del patiente e del dentista e pro evitar prevenibile situationes de urgentia in le sala de consultation. Un extense selection de medicamentos es disponibile. Le presente articulo non interprende recommendar drogas specific pro situationes particular. Le dentista debe facer su proprie decisiones secundo su experientia con respecto al plus efficace agentes in un modo de tractamento particular.

PROBLEMS OF RESEARCH

AUSTIN H. KUTSCHER, D.D.S.*

EDITOR'S NOTE: This is the second of a series of articles on "Basic Science Reviews," edited by J. Lewis Blass and S. Sigmund Stahl. Problems of research play an important part in the development of research in Dental Medicine.

On contemplating the subject of medical and dental research, the first impression is of the enormity of the philosophical literature concerning this area of effort. The imperative need for further study on the subject of research itself becomes increasingly apparent.

RESEARCH ON RESEARCH

With the above in mind as a premise, it seems entirely logical that we should consider undertaking a group of studies and conclaves on the methodology, philosophies, mores, ethics, and principles of research, thus both directing attention to and obtaining answers to some of the pertinent problems of research and investigators. An understanding of the problems of research can perhaps best be obtained from a consideration of some of the questions to which we must find the answers. Herewith then are a group of typical questions—by way of probing these problems and to arouse curiosity concerning them:

What have been the circumstances surrounding the major successes in research? How many years of work were spent in the immediate field? How many different approaches preceded this success? Was the hypothesis in keeping with or opposed to then current concepts?

Can the flame of research in the student be expected to result from spontaneous combustion? Or must we "lead the horse to water"? Where does research fit in our educational system?

Are discoveries attended by relative unhappiness or disquiet, or easement of anxieties of and for the investigator?

How can some of the seeming incompatibilities between science, scientific research, and religion be shown to be less than the paramount importance they seem at first impression?

Can one tackle both basic and applied research simultaneously?

What are some of the problems of terminology, nomenclature, and jargon besetting research? What are the moral responsibilities of an author when preparing and an editor when accepting or rejecting a paper? What of our scientific literature—its style, readability, forthrightness; and the concomitant problems of delays in publication and overcrowding which have appeared all too often?

Does scientific research need a formalized code of ethics? What ethical and practical concepts should be considered in relation to the offering and acceptance by individuals, institutions, and commercial enterprise of grants, fellowships, consultantships? What should be the relationship between the spheres of commercial enterprise and academic and/or professional life? By whom should research be supported? Is it proper to use research funds obtained for the performance of a given project for *other* studies?

If more funds were available for research, would the investigator: undertake additional work in new or broadening areas of investigation; continue with same work load but increase the salaries he disperses; take some additional income for himself; produce more and better results sooner?

What problems are inherent in a situation when studies on humans are confused by the fact that the observer is also a man and that the researcher is frequently responsible for the welfare of his patient, with all the socioeconomic and ethical implications attached thereto?

What of questionnaires and surveys upon which our studies on research must be largely based? What types are suitable; to whom should they be sent; what information can be derived and with what assurance of accuracy; and with what biases perhaps introduced?

The list goes on in seemingly never-ending ramifications. But let us consider next some even broader questions together with some tentative answers.

WHAT SHOULD BE THE SCOPE OF DENTAL-MEDICAL RESEARCH?

Among the innumerable outstanding contributions to the understanding of research per se was the Perry lecture[21] delivered by the late Dr.

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Alan Gregg—then director for the Medical Sciences at Rockefeller Foundation,—and entitled "Furtherance of Medical Research." He has described research succinctly as follows:

"The uniformity of nature and the unity of science forbid us to circumscribe the content of medical research. By so much as man has a body the methods and the knowledge of physics and chemistry are of primary importance to medical research. By so much as that body is alive medical research finds all the fields of biology at least germaine to its interests, and suggestive by analogies and comparisons. The subtleties of man's thoughts and emotions and the far reaches of his spirit, as well as its at least temporary anchorage to the flesh, extend the bearing of medical research in other directions or dimensions. Nor is medical research limited at all to the study of disease. The very unity of science justifies, where, indeed, it does not enjoin, the use of any science to extend and to refine our knowledge of the substance, the behavior, in short the *nature* of man. There is also veterinary medicine—a fact which suggests that medical research is biological research with perhaps more frequent, but not obligatory, reference to human beings in disease and in health. As you can see it is by no means the prerogative of possessors of the M.D. degree.

From the study of disease, medical research is moving forward to the study of health and the knowledge of what is essential to optimum performance and happiness. It concerns the optimum conditions for function of the mind and the emotions of man, the still hidden secrets of what beauty and strength he can pass on to his children genetically, the best factors for living a life of long health, imagination, courage, and good nature."

WHAT ARE THE INGREDIENTS OF RESEARCH?

Gregg notes that a research project should be examined for the measure in which it possesses four components:

"1. The *man*, who should be intellectually gifted, curious, unsatisfied, persistent, preferably healthy, though not necessarily young.

2. A good problem or a promising field of interest or curiosity, i.e., a question which offers in the present state of knowledge and methods a promising lead or chance of development.

3. Recruitment by which is meant the continuation, through training of the coming generation, of advances obtained, and the possibility of bringing fresh minds and energies to the resolution of problems still unsolved.

4. Favorable circumstances, e.g., support of a financial sort for the payment of salaries, supplies, instruments, housing, and the opportunity of keeping in contact with the work and ideas of others."

WHAT ARE SOME OF THE ESSENTIAL INGREDIENTS OF THE SO-CALLED "CONTROLLED" INVESTIGATION?

Albritton[1] has suggested that the author must "have command of the principles of experimental medicine." These principles are a body of knowledge made up of logic and arithmetic used in the design of experiments and the evaluation of experimental data from them. He suggests the observance of the following six unities of experimental design to be absolutely essential: unity of time, place, material, procedure, personnel, and mental attitude.

WHAT PHILOSOPHIES UNDERLIE RESEARCH?

"The Art of Scientific Investigation" by Beveridge reveals an excellent and thought-provoking group of concepts, answering some of our questions. But again it must be pointed out that the conclusions are philosophical.

WHAT OF THE ROLE ON CHANCE IN SCIENTIFIC RESEARCH?

"The names of Pasteur, Gram, von Mering, Minkowski, Richet, Ringer, Durham, Hopkins, Weil, and Felix illustrate the role that chance can play in discovery. In biology and medicine most discoveries probably have been unexpected, or at least have had an element of chance in them, especially the most important and revolutionary ones. This chance-element in discovery has been mentioned in books written on the scientific method. The research worker should be on the alert for and ready to profit by the chance discovery made by giving attention to the slightest clue. Interpretation of the clue may be most difficult and well may require the *'prepared mind'*."

What constitutes the prepared mind? To prepare the mind, should education be broader or should specialization trends continue?

FROM WHERE DO IDEAS EMANATE?

Beveredge suggests that:

" 'Conjuring up' an idea is something that happens to us rather than something we do, and usually results from an immediately preceding thought calling up associations developed by past experience and education. It is not possible deliberately to create ideas. Dewey says that the intellectual element in thinking is what we do with suggestions after they arise. Originality often consists in finding connections

between two or more ideas not previously shown to have any such relationship. 'Daydreaming' and/or visualizing can stimulate imagination and produce original ideas."

"Christopher Columbus, Löffler, Roux, Bernard, Schmidt, Ehrlich, and Domagk are names illustrative of discoveries originating from *hypotheses*. Hypothesis is the main mental tool of the investigator whose essential use thereof is to suggest new experiments or observations, and also to help ascertain the significance of an object or event that otherwise would mean nothing. An hypothesis occasionally is very fruitful without being correct; in fact, the vast majority of hypotheses prove to be wrong."

HOW PROMINENT A ROLE SHOULD STATISTICS PLAY IN RESEARCH?

Statistics are so commonly used that they can even be abused in terms of both research and the laity. But the science of statistics was developed by *study* to meet the problems raised by our unsure steps in research. Hill[12] has observed:

"Statistics are curious things. They afford one of the few examples in which the use, or abuse, of mathematical methods tends to induce a strong emotional reaction in non-mathematical minds. This is because statisticians apply, to problems in which we are interested, a technique which we do not understand. It is exasperating, when we have studied a problem by methods that we have spent laborious years in mastering, to find our conclusions questioned, and perhaps refuted, by some who could not have made the observations himself."

Overall statistics seem invaluable because of their usefulness in solving many of the problems the researcher meets in his work, proof of efficacy of techniques, etc. Several books on statistics solve some of our problems of interpretation of data, including that by A. Bradford Hill[12] and, in dentistry, that by Neal W. Chilton.[15] Hill puts it this way:

"In clinical medicine today there is a growing demand for adequate proof of the efficacy of this or that form of treatment. Often proof can come only by means of a collection of records of clinical trials devised on such a scale and in such a form that statistically reliable conclusions can be drawn from them. However great may be our aversion to figures, we cannot escape the conclusion that the solution of most of the problems of clinical or preventive medicine must ultimately depend on them. An additional difficulty is that few medical men have been trained to interpret figures or to analyze and test their meaning by even an elementary statistical technique."

HAVE THERE BEEN STUDIES DESIGNED TO SERVE AS GUIDEPOSTS TO RESEARCH PROCEDURES? ARE THEY PRACTICABLE? USEFUL? FEASIBLE?

A study recently undertaken by the American Association of Dental Editors resolved the need for experimental controls in scientific research, with the hope that an agreed on principle will filter through to researchers and editors alike. Researchers will not undertake research without suitable experimental controls and editors will not accept such manuscripts in their absence. Another previously completed program of great use concerned the formalization of a protocol for a caries testing program as described by Russell.[35]

Some of the essential requirements for effective research in dental therapeutics have been succinctly described by Pearlman.[32] Beecher[7] has very clearly drawn the lines of useful clinical research against the often misleading clinical impression—but this appeal also poses many problems of implementation. The problems raised by and the need for negative reports in the literature have been stressed also.[26]

The reader's attention should also be called to an outstanding book[30] which details some of the modern trends, the exciting achievements, and the problems of research.

A journal devoted to the publication and dissemination of such philosophical papers and studies on research per se as described above, including suggested techniques for research—a "Journal of Medical-Dental Research," is urgently needed.

WHAT ARE THE PROBLEMS OF THE SCIENTIST-INVESTIGATOR — FURTHER INDICATIONS FOR THE NEED FOR THE STUDY OF RESEARCH PER SE?

In a brief, provocative masterpiece entitled "Some Unsolved Problems of a Scientific Career," [23] Kubie has called attention to the need for research on research workers to ascertain their problems, rewards, and the type of life they lead. Kubie provides food for thought for those who have not realized the problems of the scientist-researcher:

Do scientists as human beings pay a high price

in that their emotional problems are generally overlooked during their early preparation for a life of scientific research? What special economic stresses occur in the life of the young scientist? Does the life work of the scientist express conscious levels, intellectual aspirations, unfulfilled instinctual needs, and unconscious conflicts.

Is it honorable to educate young men to high scientific ideals for a life of science unless we give the repeated warning that they may never be able to earn a dignified independence for their own old age and an education for their children which will be comparable to their own? Are the rewards of a career in science slow and uncertain? Must a scientist sacrifice his recreation to a scientific career? His family? His practical security? Does the scientist lead a simple life? A secure life? A peaceful life? A dignified life? A realistic life?

Are young scientists more hardened today than generations ago? More cynical? More embittered? More immoral? More disillusioned?

What conscious forces determine a young man's choice of scientific research as a career? Does he put more emotional eggs in one intellectual basket than he should? Should wider use be made of the aptitude test in the choice of scientific careers or should tests be restricted mainly to screening out applicants who want desperately to be accepted by a special branch for some particular reason and may exaggerate or hide skill or ineptitude? Can one "try himself" in the field of research for a limited time?

Does an unconscious symbolic significance of a particular scientific problem or theory distort the logic and judgment even of men of exceptional ability? Are unresolved neurotic tendencies responsible for some investigators picking a lifetime task in order to perhaps postpone a day of reckoning indefinitely?

Are there men of imagination and erudition whose scientific lives are baffled and unproductive? Are there men with lesser gifts who seem to function freely, creatively, and productively? Are there others who become depressed in spite of acknowledged success?

During the exploratory phase of investigation (while crude data are being gathered) should the investigator be free from rigidity of purpose, plan, and future direction? Should the theoretical scientist be forced not only to be logical but also to confront the sick patient or the actual study he designs to test his theories?

Should it be one of the duties of scientists and educators to gather statistics on the life struggles of scientists to indicate, for instance, how many scientific failures it takes to make one Pasteur?

Each of the above queries reflects the problems accompanying a life in science. Each in turn poses many other unanswered problems.

DOES THE GENERAL PRACTITIONER HAVE A PLACE IN RESEARCH?

Yes, there is a place in research for the general practitioner.[24-26] A tabulation[25] of the returns from 50 dentists replying to a questionnaire survey suggested the desire and willingness of these men to engage in and participate in research programs when provided with suitable guidance and facilities.

One of the deans of American medicine, Walter C. Alvarez,[2] has suggested that general (medical) practitioners should be encouraged to study with an inquiring turn of mind and a notebook as a constant companion. He feels they should study:

"1) hereditary defects and diseases such as the minor manifestations of mental disturbances; (2) dysmenorrhea, its hereditary aspects and relation to consitutional disease; (3) useful methods of treatment; (4) care of the aged; (5) diseases due to stress; (6) prognosis, good or bad—the general practitioner is often the one physician who knows whether the specialist's operation really did any good; (7) the recognition and description of the early symptoms of lifelong disease, such as the psychoses and epilepsy; (8) the many bizarre and atypical forms of diseases; (9) carriers of diseases such as epilepsy; (10) mode of spread of infectious disease through a community; (11) the incidence of many diseases such as migraine or peptic ulcer in the community; and (12) the incidence of mild forms of disease in many persons who are assumed to be normal but really are not."

For each of these areas there is probably a counterpart in dentistry.

Typical of research in the medical field which can be performed by general dental practitioner researchers is that which has already been undertaken by the New York State Dental Journal, the Midtown Dental Society, and the Council on Research of the New York State Dental Society which has to do with obtaining morbidity data on oral diseases. There are certain projects involving general practice upon which only a general practitioner can make the observation which, in these instances, can be of help to other general practitioners. But overall, where should general practitioner research be "slotted" in our general picture of scientific investigation? What reliance can be placed on his findings? In what areas should

he work? What use can be made of his services?

WHAT ARE THE PHYSICAL AND TANGIBLE REWARDS OF RESEARCH?

Gregg[21] points out that research is now accorded a unique place by society and that the possession of an effective institution of medical research has now become a matter of national and even regional pride. Fortunately, society has apparently been disposed to accord a welcome to medical research—recognizing the gains for which the laity is beholden to the investigators—especially when the costs of such research are compared to the expenses of government, military defense, etc.

The past has shown that medical research pays handsomely as a form of expenditure for the public good. But what form of support is most advantageous? Which areas require what amount of support to produce maximum efficiency of overall use of existing human and plant facilities?

Of basic importance, how can the public be educated to look with favor upon and understand the "egghead"; to assist men in their pursuit of the scientific career? How can we educate society as a whole to the true purposes, importance, and worthiness of our scientific edifice?

Who would disagree with Dr. Gregg's philosophical concepts[21] that the attainment of much of the better life must await the findings of research directed at the understanding of man's disease and man himself! And that in the former, pursuit of medical knowledge must reach out to all areas in all-embracing search; in the latter instance, only time can tell the ultimate role of medicine in the achievement of peace on earth.

SUMMARY

The preceding has attempted to summarize a few of the prominent problems confronting dental-medical research today. Even though many investigators are fully occupied with their clinical efforts and while others are equally absorbed in their basic research, a plea is made to more individuals inside and outside the immediate sphere of research to investigate its problems. The importance of the need for the study of research per se cannot be over-emphasized.

The almost hesitant answers presented to several of the questions posed are, in a sense, not answers at all but provide only the barest outline of the subdivisions of each question which must ultimately be studied intensively.

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PROBLEMAS DE RECERCA

Dr. chir. dent. Austin H. Kutscher

SUMMARIO IN INTERLINGUA

Le autor ha tentate summarisar alicunes del problemas prominente que se presenta hodie al recerca dento-medical. Ben que multe investigatores es completemente occupate con lor effortios clinic e durante que alteres es equalmente absorbite in lor recercas fundamental, nos urge que un plus grande numero de individuos—intra e extra le sphera immediate de recerca—investiga problemas del natura hic discutite. Le importantia e le necessitate de studios recercari per se non pote esser exaggerate.

Le responsas, quasi hesitante, que nos presenta a alicunes del questiones proponite, es, in un certe senso, non responsas del toto. Illos provide un mer schizzo del subdivisiones de iste questiones. Ultimemente omne tal subdivision debe esser studiate intense- e individualmente.

AMERICAN ACADEMY OF DENTAL MEDICINE

THIRTEENTH ANNUAL CONVENTION

May 14, 15, 16, and 17th, 1959

THE CLARIDGE HOTEL, ATLANTIC CITY, N. J.

* * *

YOUR HOSTS — THE JERSEY SECTION

Dear Colleague:

Now is the time for all to make plans to attend the 13th annual convention of the Academy to be held in Atlantic City, N. J. May 14-17, 1959.

Arrangements have been completed to make this meeting one of the finest available. The program is to be presented by outstanding clinicians in the various fields of dental medicine. The place is one of America's outstanding resorts, where your every pleasure for relaxation or amusement is available, and where most will be supplied by the convention.

Fill in the enclosed reservation forms now and drop in the mail with your fees. You will have done your share if you do that and we will strive to outdo everything that has been done for your edification and pleasure in the past.

For the Convention Committee,
Reuben Feltman and Frank Schambach
General Chairmen

THE AMERICAN ACADEMY OF DENTAL MEDICINE

13th ANNUAL CONVENTION

May 14, 15, 16, and 17, 1959
The Claridge Hotel, Atlantic City, N. J.

Program

Thursday, May 14th

12:00 Noon to 9:00 P.M.—Registration
Windsor Lounge

2:00 P.M. Board of Trustees Meeting—
Board Room

8:00 to 11:00 P.M.—Hospitality Party—
West Room

—•—

Friday, May 15th

9:00 A.M. to 5:00 P.M.—Registration—
Windsor Lounge

Scientific Session—Trimble Hall

"THE ROLE OF ORAL MEDICINE IN THE PRACTICE OF DENTISTRY"

Greetings

9:00 A.M. **"The Basis for Roentgenographic Manifestations of Oral Disease."**
Emanuel Cheraskin, M.D., D.M.D., Professor and Chairman, Section on Oral Medicine, Univ. of Alabama School of Dentistry, Birmingham, Alabama. Consultant in Oral Medicine, Veterans Administration.

10:30 A.M. **"Ulcerous and Granulomatous Lesions of the Mouth."**
Lester R. Cahn, D.D.S., F.D.S.-R.C.S. (Eng.), F.D.S.R.C.S. (Edin.) (Hon.), Associate Professor, Chairman of the Division of Oral Pathology, Columbia University School of Dental and Oral Surgery. Oral Pathologist, Mount Sinai Hospital, New York City.

11:30 A.M. to 12:00 noon—Question and Answer Period

12:30 P.M. Luncheon—Trimble Hall

2:00 P.M. **"The Interrelation of Systemic Imbalances and the Behavior of Oral Tissues."**
S. Sigmund Stahl, D.D.S., M.S., Assistant Professor, Department of Periodontia and Oral Medicine, New York University College of Dentistry, Attending Periodontist, Veterans Administration Hospital, Brooklyn, New York. Teaching Associate, Murry and Leonie Guggenheim Foundation Institute for Dental Research.

3:00 P.M. **"The Oral Microbiota in Health and Disease."**
Harry Blechman, D.D.S., M.A., Associate Professor and Chairman, Department of Microbiology, New York University College of Dentistry. Executive Secretary, Murry and Leonie Guggenheim Institute for Dental Research.

4:00 to 4:30 P.M.—Question and Answer Period

6:30 P.M. Reception—
Your Hosts—The New Jersey Section, Park Lounge

7:30 P.M. Awards Dinner—Trimble Hall

—•—

Saturday, May 16th

Scientific Sessions—Trimble Hall

9:30 A.M. **"Drug Therapy of Oral Diseases —1958."**
Austin H. Kutscher, D.D.S., Research Associate and Lecturer in Clinical Pharmacotherapeutics, Division of Stomatology, School of Dental and Oral Surgery, Faculty of Medicine, Columbia University.

10:30 A.M. **"Oral Lesions Pathognomonic of Systemic Disease."**
Harold J. Jeghers, M.D., Professor of Medicine, Seton Hall College of Medicine and Dentistry.

11:30 A.M. to 12:00 noon—Question and Answer Period

12:30 P.M. Luncheon—Trimble Hall

2:00 to 4:00 P.M.—Business Meeting—Trimble Hall

7:00 P.M. The President's Reception—Park Lounge

8:00 P.M. Dinner Dance—Trimble Hall

—•—

Sunday, May 17th

Scientific Session—Trimble Hall

"ENDODONTICS"

9:15 A.M. **Introduction**
Bernard W. Greenberg, D.D.S., Assistant Professor and Chairman of the Department of Endontics, Fairleigh Dickinson University School of Dentistry.

9:30 A.M. **"Rationale for Successful Endodontics."**
Morris B. Auerbach, D.D.S., Associate Professor and Chairman, Department of Endodontics, New York University College of Dentistry.

10:30 A.M. **"The Relationship of Endodontics to Oral Medicine."**
George G. Stewart, D.D.S., Assistant Professor of Endodontics, Temple University School of Dentistry. President of the American Association of Endodontics. Secretary of the American Board of Endodontists.

11:30 A.M. Question and Answer Period.

12:30 P.M. Academy Award Luncheon—Trimble Hall

2:30 P.M. Board of Trustees Meeting—Board Room

All sessions will start promptly at the times indicated

1959 Annual Convention Committee

Dr. Reuben Feltman, Dr. Frank H. Schambach ... General Chairmen

Dr. Louis B. Kelsten ... Secretary-Treasurer

Dr. Abram I. Chasens ... Scientific Program

Dr. Harold A. Lentz ... Registration

Dr. James B. Dickinson ... Publicity

Dr. Samuel A. Ament ... Printing

Dr. Harold R. Gelhaar ... Hotel and Social Arrangements

Dr. George F. Clarke ... National Chairman

Dr. Reuben Feltman ... President, New Jersey Section

PROGRAM FOR THE LADIES

A. A conducted tour through three acres under glass of Fischer's World Famous Greenhouses in Linwood where 100,000 African Violets are grown annually.

From there you will visit the Lenox Plant, Home of the World's Famous Lenox China.

Then to the L. N. Renault & Son Winery in Egg Harbor City, Distillers of renowned wines and champagne. Free refreshments will be served here.

Capable guides will point out places of interest enroute. This will be a three hour tour.

B. A **surprise** luncheon.

C. Mrs. Philip C. Lowenstein will exhibit an unusual and interesting hobby with participation by the guests.

Hostesses:

Mrs. Harold R. Gelhaar

Mrs. Philip C. Lowenstein

Mrs. Samuel Turkenkopf

EDUCATION COMMITTEE SPONSORS CLINIC AT THIRTEENTH ANNUAL MEETING

The Education Committee of the American Academy of Dental Medicine is sponsoring a clinic at the Thirteenth Annual Meeting which will be held in Atlantic City, May 14-17, 1959.

Dr. Martin J. Cain, Jr., Assistant Professor in the Department of Prosthodontics, Seton Hall College of Medicine and Dentistry, will discuss "The evaluation of the remaining teeth in partial denture service". Dr. Cain is a Diplomate of the American Board of Prosthodontics, Associate Fellow of the Greater New York Academy of Prosthodontics, and was formerly Clinical Instructor at the University of Michigan where he received his Masters Degree in Denture Prosthetics.

The clinic will stress the importance of examination and evaluation of the existing dental conditions. The method by which this examination is accomplished, and by which we can determine the relative importance of each individual remaining tooth will be elaborated on. Prime consideration will be given first to the probable design of the appliance and second to the foreseeing of the future changes in the remaining dental organ. The possibility of incorporating any artificial teeth and the strategic placement of the various parts of the artificial denture will also be discussed.

There will be no additional charge for this clinic to those registered at the annual meeting. The time and place for the clinic will be announced at the Atlantic City meeting.

HAROLD E. BRENNAN, *Chairman*

13th ANNUAL CONVENTION
AMERICAN ACADEMY OF DENTAL MEDICINE
Hotel Claridge Atlantic City, New Jersey
May 14, 15, 16, and 17, 1959

Dr. Harold A. Lentz
619 Main Avenue, Passaic, N. J.

Dear Harold:

Please enter my reservation for the Annual Convention.

- ☐ Members' Reservation Fee $45.00*
- ☐ Ladies' Reservation Fee 40.00*
- ☐ Registration Fee for Non-Member 50.00*

☐ My check to the amount of $..... is enclosed.

* **This covers all fees for scientific sessions, luncheons, banquets, dances, cocktail parties and ladies' tours.**

I will bring ..... children and will (not) need a baby sitter.

Dr. .....

Address .....

☐ I have filled and mailed the hotel reservation card.

THE RELATION OF THE ORAL PHYSIOLOGY OF CARBOHYDRATES TO DENTAL CARIES SUSCEPTIBILITY*

J. F. Volker, A.B., M.S., D.D.S., Ph.D.**

The researches of Mantegazza, Magitot, and Miller in the latter half of the 19th century served as a basis for the so-called chemobacterial theory of dental caries. This theory postulates that retained oral carbohydrates are acted on by oral microbial enzymes to produce products that alter the integrity of the enamel in such a way that a carious lesion is formed. Although the laboratory investigations of the aforementioned triumvirate gave strong support to a local etiologic concept of dental caries, they did not rule out unequivocally the possibility that dietary carbohydrates might initiate dental caries through a systemic mechanism. The beautifully conceived and executed researches of Kite, Shaw, and Sognnaes[1] have done much to clarify this point.

These investigators have fed comparable carbohydrate-containing diets to two groups of laboratory rats. One group was permitted to eat the diet ad libitum; the other group was fed only by stomach tube. Subsequently the two groups were sacrificed and the dentition examined for tooth decay. The rats that ingested the food normally had on an average caries in five of their twelve molars. An identical number of rats that were fed by stomach tube failed to develop any carious molar teeth. These findings, shown in Fig. 1, demonstrate that fermentable carbohydrates must be in contact with the tooth surface if they are to initiate the carious process. They do not answer the question, however, as to how long or what type of contact of carbohydrate with the tooth surface is needed to produce a carious lesion. The latter query highlights the importance of expanding our knowledge of the oral physiology of carbohydrates.

Beginning in the early 1940's, our laboratory carefully reviewed the literature relative to the problem. Shortly thereafter we began investigations which are now continuing in their second decade.[2] Initially we were able to confirm prior investigators who had reported that several hours after the ingestion of a meal the resting saliva contains negligible quantities of reducing sugar (20 mg. or less). Subsequently, groups of dental students were fed a variety of carbohydrates including chewing gum, soft and hard mints, chewy candy, cookies, bread and jam. Samples of their saliva were taken for analysis at the beginning of the experiment and at five, fifteen and thirty minutes. Levels of as much as 2,000 mg. per cent reducing sugar were recorded at the five minute test period for the chewy candy but in all instances the amount of sugar detectable in the saliva after thirty minutes was negligible. This is illustrated in Fig. 2. When a similar experiment was done, using Army field rations or large lollypops as the source of test carbohydrate, large quantities of reducing sugars were detectable in the saliva for periods of one to two hours.

As a logical extension of these researches a study was made of the influence of the physical form of the sugar on its oral clearance pattern. Test subjects were given 500 mg. of glucose in a cake to be eaten, a wafer to be sucked, a solution to be rinsed, and a gum base to be chewed. Marked differences were observed with the carbohydrates in solution being cleared with surprising rapidity as contrasted with the prolonged oral retention of carbohydrate in sucked wafers. In summarizing our findings we stated: "Attention is called to the possible significance of the findings in relation to the causation of dental caries."[3]

Several laboratories have made extensive and continuing studies of the oral retention of carbohydrates with reference to dental caries susceptibility. Bibby and his collaborators[4] have

* Presented before the 14th Annual Meeting of the American Institute of Dental Medicine, Palm Springs, California, October 13-17, 1957.

** Dean, School of Dentistry, University of Alabama, Birmingham, Alabama.

Figure 1

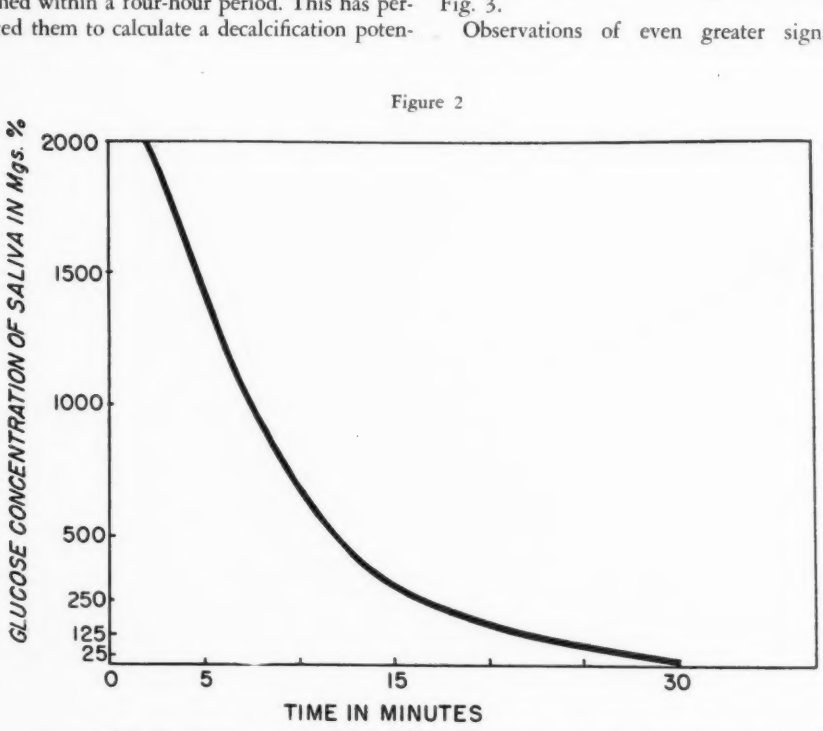
Caries in Rats Fed a Decay-producing Diet via Normal and Stomach Tube Routes

Group	Method Of Feeding	No. Of Rats	Ave. No. Of Carious Molars	Ave. No. Of Carious Lesions
A	Normal	13	5.0	6.7
B	Stomach Tube	13	0	0

had clinical subjects ingest a variety of common carbohydrate-containing foods. After eating they have determined the amount of food adhering to the teeth. Subsequently they have incubated that amount of food with salivary microorganisms and have measured the amount of acid formed within a four-hour period. This has permitted them to calculate a decalcification potential for a considerable number of foods. They have reported that by these standards cookies, dates, pastries, candies, and ice cream are quite cariogenic. By contrast, vegetables, fruits, fruit juices, and flavored drinks have a rather limited caries potential. Their findings are illustrated in Fig. 3.

Observations of even greater significance

Figure 2



The clearance of glucose from the mouth following ingestion of a chewy candy.

Figure 3

Food Retention and Decalcification Potentials of Representative Foods

Food	Total Carbohydrate %	Free Sugar %	Food Retained Mg.	4-Hour Acid Formation Ml. 0.1 Normal Sodium Hydroxide	Decalcification Potential
COOKIE (FIG)	70	27.6	678	1.2	814
DATE	77.5	33.8	507	1.6	811
CHOCOLATE	50	39	370	2.1	777
ICE CREAM	17	..	423	1.6	677
COOKIE (SHORTBREAD)	59.5	24.8	370	1.3	481
DANISH PASTRY	53.8	40	181	1.6	434
CRACKER (SALTED)	70	11.0	340	1.2	408
CARAMEL	56.8	43	219	1.8	394
CHOCOLATE PUDDING	35	18.5	300	1.3	390
CRACKER (OIL SPRAYED)	71	12.1	310	1.2	372
TOFFEE	90	..	266	1.3	346
WHITE BREAD	49	13.0	188	1.8	338
POTATO (BOILED)	18.2	4.0	128	2.4	307
COLA DRINK	10.5	10.5	237	1	237
APPLE	17.5	11.0	228	1	228
ORANGE SODA	10.5	10.5	219	1	219
ORANGE JUICE (FRESH)	8.5	..	177	1.2	212
POTATO CHIPS	48.2	12.7	61	1.9	116
CARROT (FRESH)	9.5	..	73	1.2	88
CARROT (COOKED)	8.3	6.8	2	1.5	3

have been made by Swedish investigators.[5] Initially these workers studied the oral clearance of a variety of carbohydrate foodstuffs in two clinical subjects. They recorded the time in minutes after the food ingestion that the total sugar content of the saliva exceeded .02 per cent, .2 per cent, 2 per cent, and 20 per cent. These times were designated as a, b, c, and d, respectively, and their total tentatively designated as a caries potentiality index. Their findings, shown in Fig. 4, are in general agreement with those of Bibby's group, candies, cookies, and ice cream being most caries suspect with vegetables, fruits and fruit juices being of minimal concern.

Shortly thereafter they arranged a clinical experiment in which institutionalized subjects had substantial supplements in different forms of sugar added to their basic ration.[6] The extremes were the two groups wherein sugar was added in one instance in solution form, and in the other a sticky candy form. The studies were continued up to five years. As illustrated in Fig. 5, those persons ingesting the control diet plus added sugar in solution developed on an average .67 new carious surfaces per year. The subjects ingesting the same basal diet plus a comparable amount of sugar in the form of toffee candy had on an average 4.02 new carious lesions per year. In general, they found that the quantity of sugar in the diet was of much less importance than its ability to be retained in the mouth. They noted a very good correlation between the percentage of day that the sugar was in the saliva and the number of cavities that developed subsequently. This is summarized in Fig. 6.

Figure 4

Caries Potentiality Indexes of Representative Foods

Food	Total Sugar %	Sugar Concentration In Saliva		Caries Potentiality Index
		Maximum %	Av. Clearance Time (Min.) Above 0.2 %	
CARAMEL	64.0	18.8	5	27
HONEY + BREAD + BUTTER	19.0	4.6	7.5	24
CHOCOLATE, LIGHT	47.5	10.1	6.25	21
HONEY	72.8	5.6	5	18
SWEET COOKIES (BISCUITS)	9.0	1.9	5	18
DANISH PASTRY	30.0	2.4	2.5	13
WHEATEN BREAD	12.3	2.8	4	13
ICE CREAM	2.4	3.2	2.5	9
MARMALADE	65.3	3.5	3.5	10
MARMALADE + BREAD + BUTTER	16.3	1.8	2.5	9
POTATOES (BOILED)	0.8	1.6	2	7
POTATOES (FRIED)	3.9	0.4	2.5	7
WHITE BREAD + BUTTER	1.5	0.8	2	7
COARSE RYE BREAD + BUTTER	2.3	1.3	2	7
MILK	3.8	0.6	2	6
APPLE	7.5	0.4	1	5
ORANGE	6.5	0.3	1	3
FRUIT JUICE	11.5	1.2	1	3
LEMONADE	9.3	0.5	0.75	2
CARROT (BOILED)	2.4	0.1	..	1

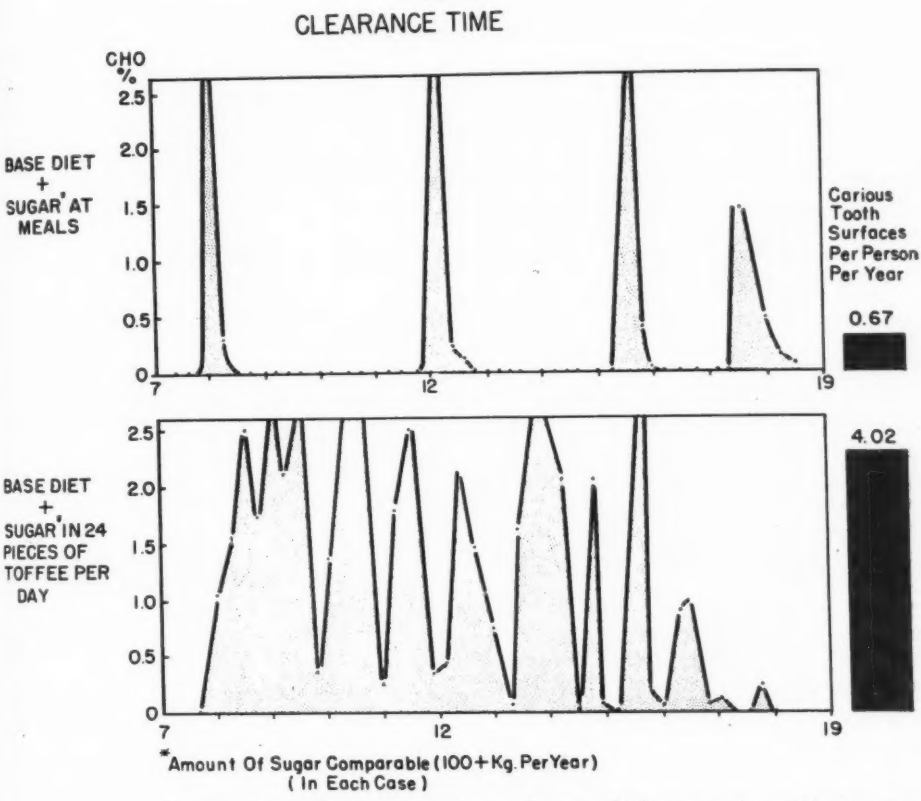
Figure 5

Influence of Added Dietary Sugar of Different Physical Form on Dental Caries

Groups	No. Of Subjects	Tooth Surfaces Becoming Carious Per Person Per Year
Control Diet	60	.30
Control Diet + Sugar In Solution *	57	.67
Control Diet + Sugar As Toffee (24 pieces/day) *	48	4.02

*Amount Of Added Sugar Consumed In The Two Experimental Groups Was Comparable (Over 100 lb. Per Year Per Person)

Figure 6



Comparison of clearance time of sugar fed at meals with clearance time of sugar fed as toffee throughout the day.

Data accumulated in our animal experimental studies seem to confirm these hypotheses. For long periods of time we have maintained hamsters on diets wherein sugar solutions were completely substituted for the drinking water without producing any carious lesions. In a more drastic experiment we have brushed the teeth of hamsters over extended periods of time with concentrated sugar solutions twice daily without being able to induce tooth decay.

If carbohydrate retention is of such major importance, it should be possible to demonstrate in experimental animals that retardation of carbohydrate clearance increases tooth decay and acceleration of carbohydrate clearance decreases tooth decay. Data accumulated in our laboratory support this view. We have found that when two comparable groups of hamsters are retained on a high sugar diet and the teeth of the experimental group are brushed daily, tooth decay is reduced by more than a third.[7] If, however, comparable groups of hamsters are maintained on high sugar diets, and the major salivary glands of one of the group are rendered nonfunctional, there is a five to tenfold increase in the anticipated amount of tooth

Figure 7

Effect of Desalivation on Hamster Caries

GROUP	NUMBER	Ave. No. Of Carious Teeth	Ave. No. Of Carious Lesions
A, Intact Salivary Glands	20	2.3	2.5
B, Desalivated	10	10.5	13.0

decay. This is shown in Fig. 7. The former observation supports the findings of Fosdick.[8] He has reported that when a rather large group of experimental subjects brushed their teeth within ten minutes after food ingestion they had a fifty per cent decrease in tooth decay when compared with a control group that maintained their normal oral hygiene habits. His findings are reviewed in Fig. 8.

A rather striking confirmation of the important relationship of food form and the oral clearance of carbohydrates in caries etiology has been observed in our laboratories. Desalivated hamsters have been placed on a ration that is principally powdered dry whole milk with water being permitted ad libitum. These animals developed a moderate amount of tooth decay. If, however, desalivated hamsters are fed reconstituted milk (whole milk powder plus water) no tooth decay occurred. Presumably the milk sugar in the former group is retained in and around the teeth for long periods of time and is degraded by oral enzymes, whereas in the latter group the diluted milk sugar is cleared rapidly.

It is also pertinent that much of the carbohydrate ingested is consumed in combination with fat and protein. It follows that these food components may influence the cariogenicity of carbohydrates. It has been observed in experimental animals that the addition of 25 per cent fat in the form of several types of vegetable oil to a sucrose ration makes for a very substantial reduction in tooth decay.[9] This is illustrated in Fig. 9. The exact mechanism of this reduction is not known but there is some evidence that the

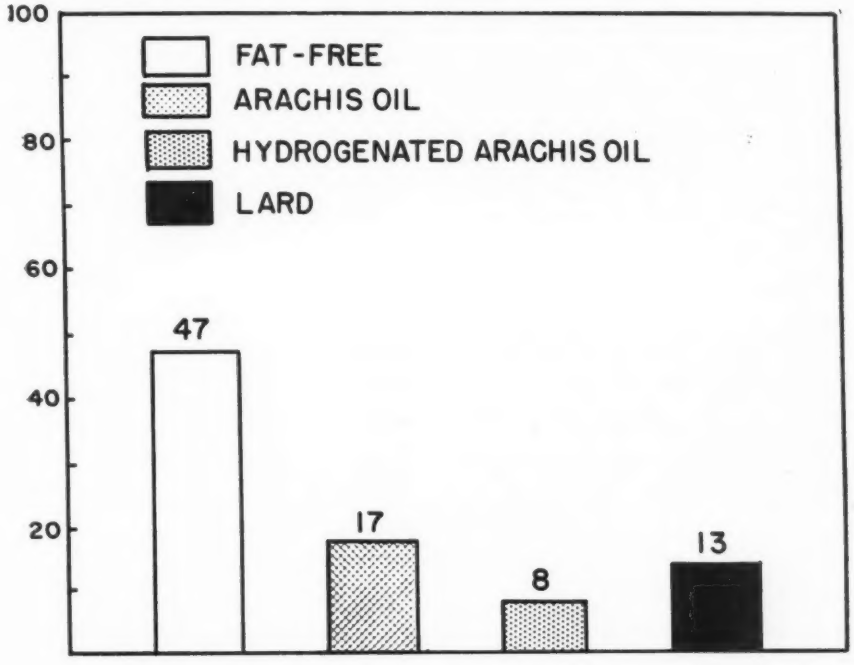
Figure 8

The Effect of Tooth Brushing Immediately after Meals with a Neutral Dentifrice for Two Years on Dental Caries Incidence

group and instructions	*no. of subjects*	*avg. no. of new carious surfaces by clinical examination*	*x-ray examination*	*% decrease over control*
Control (normal hygiene habits)	273	2.53	1.34	——
Experimental (brushing within 10 minutes after food ingestion)	429	1.49	0.53	41 (Clinical) 60 (X-ray)

Figure 9

The effect of fat on hamster caries.



solution of sucrose from a fat-containing diet is slower than from a fat-free diet. A suggestion has also been made that the presence of fat in the diet limits the ability of sugars to be retained on the tooth surface and there is initial evidence that some fatty acids interfere with the metabolism of oral microorganisms.[10]

The possible influence of protein on the cariogenicity of sugar-containing diets has been the subject of several recent investigations. It has been reported that caries in the rat is accelerated when certain experimental diets are heat treated.[11] This phenomenon seems to be associated with the destruction of the dietary amino acid lysine since the addition of lysine to heat treated rations reduces their cariogenicity. The mechanism of this reaction is obscure but it does indicate that under certain circumstances at least the type of protein in the diet may affect tooth decay.

The biochemical nature of the carbohydrates as they relate to caries etiology also deserves consideration. For many years the idea has persisted that refined carbohydrates are more prone to produce tooth decay than unrefined carbohydrates. This contention has virtually no experimental evidence to support it. In our laboratory we have tested the ability of oral salivary and

microbial enzymes to form acids from various refined and non-refined carbohydrate substrates.[2] No substantial differences have been observed. It is also noteworthy that many rations that are cariogenic to laboratory animals have substantial amounts of natural carbohydrates.

The question of the relative caries-producing capacities of complex and simple carbohydrates has also been investigated.[2] In general, it has been reported that oral microbial and salivary enzymes form acid from poly, di, and monosaccharides at rather comparable rates. These substances have also been shown to have essentially similar capacities to produce tooth decay when fed to experimental animals.

Although many authorities have advocated dental caries control by a drastic reduction in carbohydrate consumption, there is an increasing belief that such an approach is not feasible for en masse preventive therapy. As a consequence, some thought has been given to modifying the chemical nature of the carbohydrate to make it less available for destruction by oral enzymes. From a theoretical point of view this approach would seem to have possibilities. The conversion of the hexose sugar glucose to the hexose alcohol sorbitol is a relatively simple procedure. Whereas the former substance is rapidly broken down to organic acids by oral bacteria, the latter is not. For this reason it has been utilized on a somewhat limited scale in sugarless confections. Whether or not it could be used widely to replace dietary glucose is a matter of conjecture, especially since it is considerably more expensive and the details of its intermediary metabolism as they affect systemic nutrition need further elucidation.

Even more promising is the possibility that certain nontoxic substances can be added to fermentable carbohydrates to prevent their destruction by oral microbial enzymes. When Gustafsson and his co-workers were feeding various sugar additions to clinical groups, they observed that the group consuming chocolate developed less tooth decay than was anticipated. Since this could not be explained on the basis of a more rapid oral clearance of sugar, they suspected that the confection contained certain natural inhibitors. A survey of the literature of the chemical properties of certain alkaloids of the cocoa bean gave credulence to the speculation. Beginning with this hypothesis they carried out investigations[6] which showed that the addition of naringenin to saliva-sugar mixtures inhibited acid production. More recently they have added naringenin to the sugar-containing diets fed experimental animals and have noted that such a procedure definitely limits the decay-producing potential of laboratory rations.

From the researches enumerated above, the following tentative conclusions can be drawn: (1) that fermentable carbohydrates if they are to initiate dental caries must be retained in the mouth; (2) that the clearance of fermentable carbohydrates from the mouth depends more upon the physical form in which the carbohydrate is eaten than on the amount that is ingested; (3) evidence is being accumulated that, all other things being constant, the intensity of the caries attack rate is roughly proportionate to the oral retention of dietary carbohydrates and increases their cariogenicity; (5) toothbrushing accelerates the oral clearance of dietary carbohydrates and reduces their cariogenicity; (6) the presence of substantial amounts of fat in a high carbohydrate ration reduces its decay producing ability; (7) modification of the protein portion of a sugar-containing diet may alter its decay producing ability; (8) present evidence supports the view that unrefined sugars and starches are comparable to refined sugars and starches in their ability to initate caries; (9) poly and disaccharides are comparable to monosaccharides in their cariogenic ability; (10) the fermentation of carbohydrates by oral microbial enzymes may be prevented by slight alteration of their chemical configuration or by the addition of naturally occurring nontoxic enzyme inhibitors.

University of Alabama, School of Dentistry, Birmingham, Ala.

All the illustrations are prepared from original research papers. They have been recently published by the author in a section of the textbook, "Clinical Pedodontics," edited by S. D. Finn and published by W. B. Saunders, Philadelphia and London, 1957.

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LE RELATION INTER LE PHYSIOLOGIA ORAL DE HYDRATOS DE CARBON E LE SUSCEPTIBILITATE DE DISVELOPPAR CARIE DENTAL

Dr. chir. dente phil. J. F. Volker (A.B., M.S.)

SUMMARIO IN INTERLINGUA

Le supra-enumerate recercas supporta le sequente conclusiones tentative.

1. Fermentabile hydratos de carbon, pro initiar carie dental, debe esser retenite in le bucca.

2. Le elimination de fermentabile hydratos de carbon ab le bucca depende plus del forma physic in que le hydratos de carbon es mangiate que del quantitate de illos que es ingerite.

3. Se accumula documentation pro le these que, si omne altere factores es constante, le intensitate del attacco de carie es grossiermente proportional al retention oral de hydratos de carbon in le dieta. Le retention oral del hydratos de carbon augmenta lor cariogenicitate.

4. Brossar le dentes accelera le elimination de hydratos de carbon dietari ab le bucca e reduce lor cariogenicitate.

5. Le presentia de considerabile quantitates de grassia in un dieta ric in hydratos de carbon reduce su capacitate de producer decadentia.

6. Il es possibile que le modification del proportion de proteina in un dieta a contento de sucro effectua un alteration de su capacitate de producer decadentia.

7. Le datos nunc disponibile supporta le opinion que non-raffinate sucros e amylos es comparabile a raffinate sucros e amylos in lor capacitate de initiar carie.

8. Polysaccharidos e disaccharidos es comparabile a monosaccharidos in lor capacitate cariogenic.

9. Le fermentation de hydratos de carbon per oral enzymas microbial pote esser prevenite per un leve alteration de lor configuration chimic o per le addition de nontoxic inhibitores de enzyma de occurrentia natural.

Medical Views on Oral Problems

SALIVARY GLAND TUMOR*

TO THE EDITOR:—*A small tumor located right at the anterior capsule near the bone was removed, with the facial nerve and some of the parotid gland left. Four days after operation the pathologist reported the tumor to be a mucoepidermoid carcinoma in the upper grade of malignancy with a tendency to metastasize. The patient is over 72 years of age. Is surgery indicated? Should the whole parotid gland have been removed and the facial nerve cut? Should x-ray treatment be given?*

M.D., Georgia.

ANSWER.—Several general principles are applicable when the surgeon is confronted with a swelling or tumor mass of unknown nature in the parotid area. First, he should consider that the tumor is possibly, as it was in this case, carcinomatous. Second, it should be realized that, in their early stages, some malignant tumors give no clue that they are in fact malignant. The surgery should be designed to encompass the tumor with a surrounding mass of normal salivary gland tissue. If this can be accomplished without injury to the facial nerve it will suffice in many instances. If this was done in the case reported, this consultant would recommend no further treatment at this time. Most salivary gland tumors are moderately radiation-resistant, and it is not advisable to use x-ray therapy as a routine postoperative measure.

* Questions and Answers, J.A.M.A., Dec. 27, 1958, p. 2333.

PRIMARY MALIGNANT MELANOMA OF THE ORAL CAVITY: A REVIEW OF 105 CASES*

Primary malignant melanoma of the oral cavity is a rare tumor, the authors having found records of only 105 cases, including 2 previously described by themselves. This review is based chiefly on 93 cases, since the other 12 lacked adequate description. Primary malignant melanoma of the oral cavity occurred nearly twice as frequently in men as in women. This finding is in contrast to that for malignant melanoma of the skin, which affects both sexes equally. The youngest patient in the present study was 22 years of age and the oldest, 90 years; but in nearly 90% of the reported cases the patients were more than 30 years of age, and in 75% more than 40 years, with a peak in the 6th decade. The site of predilection for the disease was the upper jaw, where 75 (80%) of 93 cases originated. The other sites of involvement, in order of frequency, were the lower jaw, cheeks, tongue, and floor of the mouth. In nearly 30% of the cases there was melanin pigmentation at the site at which the neoplasm originated. This pigmentation had appeared from a few months to several years before the tumor.

Malignant melanoma of the oral cavity has been reported in all races. In more than half of the 93 cases clinical evidence of lymph node metastases was recorded. In 19 cases there was clinical or roentgenologic evidence of generalized metastases. Of the 61 patients followed, 51 died of the disease. In 24 cases the survival period averaged 18½ months after diagnosis. There were only 3 patients who lived for more than 5 years. The authors feel that, in view of the serious prognosis of the disease, early recognition of the lesion and institution of radical surgery are desirable. The appearance of melanin pigmentation in the mouth and its increase in size and in depth of color should be viewed seriously.

* Medical Literature Abstracts, J.A.M.A., Dec. 27, 1958, p. 2325.

A CONTRIBUTION TO THE MYCOLOGY OF THE MOUTH*

During recent years particular attention has been paid to mycotic infections of the oral cavity as a complication of antibiotic therapy. In an effort to supply data on the mycology of the mouth in relation to a number of fairly common oral lesions, isolations of fungi were made from patients at Birmingham Dental Hospital (England) during 1952 to 1955 to ascertain whether there were any relationships between fungi and these oral disorders. The isolations were made in the clinic by inoculating slopes of malt extract agar with scrapings taken with a sterile scapel. Incubation was at 20 to 25°C, and any fungi which developed were obtained in pure culture for identification. Bacteria and actinomycetes were ignored. Twenty-six of 175 patients were excluded from further study, because they had conditions which showed no distinctive mycological findings, such as lichen planus, lupus erythematosus disseminatus, leukoplakia, fungating antrum carcinoma, and dry socket. The remaining 149 patients were grouped as having 6 clinical conditions, namely, angular cheilosis, gingivostomatitis (comprising aphthous, herpetic, acute ulcerative, mycotic, and various stages of inflammatory periodontal conditions), lingua nigra, lingua geographica, coated tongue, and denture-sore mouth.

In some persons of the control series (groups of school children, university students, and professional and office workers) isolations were made as in the patients, but in others saliva was sampled by a single swabbing of the tongue, gums, and teeth and by streaking plates or slopes of malt agar with the swab. From the mycological findings in the 149 patients with angular cheilosis, gingivostomatitis, lingua nigra, lingua geographica, coated tongue, and denture sore mouth, it is concluded that Candida albicans seems to play a primary part in the etiology of angular cheilosis and has some connection with the etiology of gingivostomatitis. The diverse fungi associated with the remaining 4 conditions are of uncertain etiological significance.

* Medical Literature Abstracts, J.A.M.A., Dec. 27, 1958, p. 2302.

THE PREDIABETIC STATE AND LARGE BABIES

Probably all who have cared for many diabetic patients have had occasion to observe some of the characteristics of diabetes in individuals who lacked any detectable evidences of disturbed carbohydrate metabolism. Even the response to the glucose tolerance test has been normal. But, after some years have elapsed hyperglycemia and glycosuria appear. A common indication of a prediabetic state is seen in women who give birth to large babies. The prediction that the mother of an infant weighing more than 10 pounds at birth will ultimately develop clinical diabetes is more likely than not to be fulfilled. This result is especially likely if the mother has diabetic relatives.—G. G. Duncan, The Modern Aspects of the Diabetic Problem, *Bulletin of the New York Academy of Medicine*, February, 1958.

ULTRASOUND AND HEADACHES*

TO THE EDITOR:—*This problem concerns the evaluation of headaches and emotional irritability in a group of men working in a large aluminum plant. In one particular part of the plant, ultrasound is used to test for structural defects. A frequency of from 200 kilocycles to 25 megacycles is used. The operator of the ultrasound machine directs the passage of the transducer over the metallic member and detects any structural flaws by looking constantly at a cathode ray oscilloscope—for periods up to eight hours. The foreman and all the men under his jurisdiction have complained of chronic headaches and increased emotional irritability. They believe that the ultrasound has something to do with their symptoms. Although the men are not in direct line of the direction of the sound waves, they are required to clean the crystal covering the sound transducer and they work in an enclosure approximately 60 ft. long by 40 ft. wide. No authoritative reports have been seen which will help in determining whether the sound may be an etiological factor in producing the headaches and nervous irritability. Also, could peering at an oscilloscope screen for extended periods of time be a causative factor in the production of these headaches?*

Marvin B. Wolf, M.D., Adrian, Mich.

ANSWER.—This is a very interesting question. This consultant has had many similar inquiries regarding ultrasound, although the symptomatology allegedly due to ultrasound has been different in some of the cases. Present beliefs are that ultrasound will not have any untoward effect on hearing. Some difficulty has been found due to ultrasonic use as related to heat. This effect is on the local tissue, that is, through direct contact with the ultrasound by way of fluid mediums. In these cases, gloves seem to be enough protection to prevent any significant injury. The inquirer has put his finger on the problem by reference to the oscilloscope. It is true that watching a radar screen or an oscilloscope (which in effect is a radar screen) for long hours produces headaches and, as a result, nervous irritability. There is no evidence available that will support the claim that headaches and nervous irritability are due to exposure to ultrasound. Some other factor must be responsible.

* Questions and Answers, J.A.M.A., Jan. 24, 1959, p. 191/419.

MOUTH BREATHING*

TO THE EDITOR:—*A man, aged 65 years, has had the following complaints increasing in intensity for over six years. He states that after approximately one hour's sleep he is awakened by a foul taste in the mouth and his tongue becomes rough and "stiff as a board." The disturbance disappears when he sits up for about 10 minutes. This continues several times during the night, with headaches and fatigue. He also feels a "lump" in the mouth "moving in different directions," with the face stiff and numb. His history shows that he has had asthma intermittently since 1927. Please give suggestions on diagnosis and treatment.*

Arthur M. Parker, M.D., Brooklyn, N. Y.

ANSWER.—This patient apparently suffers from mouth breathing, probably induced at least in part by allergic rhinitis with polyposis. Mouth breathing, especially during sleep, is apt to cause dryness of the mouth and tongue. After waking and sitting up the patient probably reverts to nasal breathing, and after the tongue becomes moist again he is able to go back to sleep. The impact of this disturbance on the patient is likely to be intensified by introspection and anxiety engendered by failure of medical treatment to give relief. The recommended treatment includes

explanation to the patient of the probable mechanism of his distress, treatment of allergic rhinitis and polyposis by his otolaryngologist, and, for temporary relief and as a therapeutic test, the use of nose drops with naphazoline hydrochloride at bedtime and, if necessary, during the night.

* Questions and Answers, J.A.M.A., Feb. 7, 1957, p. 196/660.

RAPID DIAGNOSIS OF HERPES SIMPLEX VIRUS INFECTIONS WITH FLUORESCENT ANTIBODY*

Microscopic slides were prepared from portions of scrapings from the base of vesicular lesions. These preparations were fixed in acetone for 10 minutes, washed in physiologic saline and stained with fluorescin-labeled antiserum, which was produced in rabbits in response to subcutaneous injections of herpes simplex-virus infected extraembryonic fluids of developing chick embryo. The serum was absorbed with dried mouse liver powder. The stained smears were examined by dark-field with a mercury arc and filters.

Portions of the same specimens were inoculated onto the chorioallantoic membrane of chick embryos. Yellow-green fluorescence was observed in those specimens which caused typical herpetic lesions in the chick embryo. No fluorescence was observed in specimens which did not result in lesions of the chorioallantoic membrane.

* Abstracted by Dr. S. Leonard Rosenthal.
By Joseph Z. Biegeleisen, Jr., L. Vernon Scott and Vester Lewis, Jr. Science 129:640-1, March 6, 1959.

CARCINOMA OF THE LARYNX*

At a recent symposium on carcinoma of the larynx, sponsored by the American Cancer Society, it was evident that considerable disagreement exists in regard to the relative indications for surgery and radiation therapy. At the University of California Hospital in San Francisco, a close cooperation has existed between members of the departments of otolaryngology and radiation therapy, which has resulted in a policy by which all carcinomas of the larynx are seen jointly by the staffs of the two departments. In general, radiation therapy was given preference in all cases in which there was a reasonable possibility that irradiation would control the lesion. The present review analyzes the results of 124 patients with histologically verified squamous-cell carcimoma arising in the endolaryngeal mucosa and treated by primary x-ray therapy during the period from July 1942, through June 1952.

Ninety-six of the patients had primary lesions of the vocal cord. Of these 96 lesions, 58 were controlled by radiation therapy alone; 2 radiation failures were controlled by secondary laryngectomy. Of the 30 patients with lesions which could have been treated by cordectomy, 24 received radiation therapy and were living and symptom-free at 5 years after treatment. Twenty nine of the 43 cord lesions which would have required total laryngectomy were controlled by irradiation alone. Five of the 19 patients with cord carcinoma, too advanced for control by laryngectomy, were salvaged by radiation therapy. Only 4 of the 26 supraglottic carcinomas were controlled by radiation, but apparently none of the patients with these lesions would have been good candidates for surgery. Neither of the 2 subglottic carcinomas responded to irradiation.

* Medical Literature Abstracts, J.A.M.A., March 14, 1959, p. 207/1261.
By G. E. Sheline and R. S. Stone. Ann. Otol. Rhin. & Laryng, 67:1066-1072 (Dec.) 1958 (St. Louis).

RADIO TRANSMISSION THROUGH FILLINGS*

TO THE EDITOR:—*A 32-year-old woman who has many silver fillings in her teeth, who is otherwise physically in good health, and whose only diagnosable disease is a chronic anxiety state claims that for many years she has been able to hear radio programs even when the radio is not turned on. This occurs from time to time, and if she turns on the local station she finds that what she has been hearing in her ears is the same program that is currently playing. She lives with her husband on a farm, and there is no neighbor's radio nearby. It has been said that occasionally silver fillings can do this sort of thing. Is this legend or fact?*

M.D., Ohio

ANSWER.—When certain metals and their oxides are in a strong signal field of a radio transmitter, rectification may occur with the reception of the signal without the usual receiving equipment. This has occurred from radiators, faucets and electric stove heating units but never from amalgam restorations or fillings. It is assumed that the farm on which the patient lives is not near a powerful radio transmitter. If so, a more intensive study of this unusual complaint should be made to determine whether other members of the household hear these radio programs. If the programs are heard only by the patient, the diagnosis and treatment are obvious. In view of the known anxiety state of the patient, the chief complaint should be evaluated more critically.

* Questions and Answers, J.A.M.A., March 14, 1959, p. 217/1271.

OSTEOGENIC SARCOMA OF THE JAWS AND FACIAL BONES*

The authors report on 9 male and 10 female patients, between the ages of 11 and 60 years, with osteogenic sarcoma of the mandible, on 10 men and 4 women, between the ages of 16 and 62 years, with osteogenic sarcoma of the maxilla, and on 6 men and 5 women, between the ages of 15 and

55 years, with osteogenic carcinoma of the antrum and ethmoid region, who were treated at the Mayo Clinic before March, 1957. Most of the patients were treated surgically with or without adjunctive irradiation therapy. Several patients who received limited surgical treatment elsewhere were cured subsequently by more radical therapy, which consisted of wide surgical resection or diathermy destruction of the lesion and surrounding tissues. Eleven of the 44 patients were still living at the time of follow-up in March, 1957, and in addition 1 patient was known to be alive and well 6 years after treatment. Of the 35 patients treated before March, 1952, 11 are known to have lived for periods ranging from 5 to 28 years after their first definitive treatment at the Mayo Clinic. Six of these had mandibular, 4 had maxillary, and 1 had antral sarcoma. Of these 11 survivors, 5 had chondroblastic, 4 fibroblastic, and 2 osteoblastic osteogenic sarcomas. Neither patient with primarily ethmoidal involvement survived 5 years. Two patients died of recurrent tumor or metastasis 13 and 6 years, respectively, after their first treatment at the Mayo Clinic.

These data show that surgical treatment affords a reasonable chance of cure. A tendency to late systemic spread and a relatively low average degree of malignancy are among the factors that contribute to successful therapy. In the 44 patients symptoms were commonly present and led to many dental and minor surgical procedures before the correct diagnosis was established. This fact emphasizes that a relatively painless nonulcerating mass occurring in the upper or the lower jaw, particularly about an alveolus, should suggest the possibility of osteogenic sarcoma. In the antral and ethmoid regions, early symptoms are lacking. Roentgenographic examination is extremely helpful in most instances, but definite diagnosis depends on histological studies. In 4 patients the sarcomas arose in regions previously irradiated for benign conditions of bone or soft tissue. More alertness on the part of dentists and physicians would favor earlier correct diagnosis and treatment of osteogenic sarcoma of the jaw.

* Medical Literature Abstracts, J.A.M.A., Ses. 27, 1958, p. 2302.
By L. V. Kragh, D. C. Dahlin and J. B. Erich. Am. J. Surg. 96:495-505 (Oct.) 1958 [New York].

NONIRRITATING MATERIALS FOR PROSTHESIS*

TO THE EDITOR:—*What malleable metals or plastics can be imbedded in human tissue without corroding or causing local irritation? Where can such materials be obtained?*

G. D. Gregory, M.D., Chicago Heights, Ill.

ANSWER.—Many surgical materials have been tested in the hope that one could be found which is not subject to corrosion and which produces no foreign body reaction. However, all have shown some foreign body reaction, and spectrographic analysis of the tissues which have been in contact with metals buried in the body usually shows the presence of an appreciable quantity of metallic ions in the tissues, indicating that some corrosion is going on. No metal or alloy has been absolutely resistant to corrosion when immersed in sea water. The same effect is exhibited by body fluids. There is, however, a great quantitative difference in the amount of corrosion and in the severity of the reaction to various metals and plastics. The 18-8-SMO stainless steels (type no. 316, 317), the non-ferrous alloys, such as cobalt-chromium-molybdenum, and titanium (pure metal) show the least corrosion and the least foreign body reaction of the metals commercially available (Jergesen, Studies of Various Factors Influencing Internal Fixation as a Method of Treatment of Fractures of the Long Bones, report to the National Research Council, Committee on Veterans Medical Problems, contract V1011 M-1945). Plastic materials show no corrosion, but hip prostheses made of acrylic and nylon have produced such severe foreign body reactions that their use for this purpose has been abandoned. Oppenheimer and co-workers (*S. Forum* 4:672, 1953) showed that sarcomas can be produced in the experimental animal by implanted plastic materials. The conclusion seems inescapable that all prosthetic devices should be tested in the laboratory and in experimental animals before they are used in human beings. Efforts are being made to develop methods of testing and specifications for manufacture of devices to be used in the body. The legal as well as the medical implications have been pointed out (Report of the Joint Committee for the Study of Surgical Materials, *J. Bone & Joint Surg.* 36-A:411, 1954).

* Questions and Answers, J.A.M.A., Feb. 21, 1959, p. 203/901.

BUCCAL MUCOSAL TESTS IN PATIENTS WITH CANKER SORES (APHTHOUS STOMATITIS)*

Recurrent canker sores (aphthous stomatitis) are common in children and young adults, but their etiology is not known. Allergic etiology has been considered but has not been proved. There is general agreement, however, that excessive ingestion of such foods as citrus fruits, melons, tomatoes, vinegar, wine, chocolate, and nuts (walnuts) seems to play a role in the formation of the ulcers. Other suggested etiologies include (1) avitaminosis, since improvement at times follows vitamin B or vitamin C therapy, and (2) bacterial infections, since diplococci and streptococci are found in cultures from the lesions. The canker-sore lesions begin as small, single or multiple, yellow-gray papulovesicles, 2 or 3 mm.

in size. These lesions are quite sensitive. Within a few hours they change into tender ulcerations, which is the way they usually appear by the time they are inspected. The sites most often involved include the buccal mucosa, the edges of the tongue, the gingivae, and the palate. The oral lesions appear in successive crops at irregular intervals. They heal without scarring in a week or two. In 1956 Tuft and Ettleson reported the results of a clinical study of an allergic patient who had recurrent canker sores of the mouth for many years. They were able to reproduce these ulcers by direct application of citric acid and acetic acid to the buccal mucosa, and thus they proved the etiological relationship of these agents to the canker sores. Their results prompted further investigations into the possibility of utilizing this method of testing as an aid in etiological diagnosis not only in patients with canker sores but perhaps also in those with other forms of allergy to food or drugs.

The authors describe studies on patients with recurrent canker sores. Various methods were tried, and the following method was evolved. The authors placed 0.5 cm. of testing material, if crystalline (as in the case of citric acid and tartaric acid), or a 0.5 cm. cotton pledget saturated with the liquid organic acid (as in the case of acetic acid, vinegar or lactic acid) on the anterior buccal mucosa on either side of the frenulum of the lips and as far laterally (1 cm.) from the frenulum of the lower lip as possible in order that 2 tests could be done at one time. The test material was removed at the end of 3 minutes. Only 4 organic acids, citric, acetic, tartaric and lactic, were tested, since these were commonly found in foods. Citric and tartaric acid were tested in powder form. Acetic acid was tested as a 5% solution or as vinegar. Lactic acid was tested in 0.1 *N* solution (pH 2.4), which approximates the concentrations usually used in food recipes.

The test was found diagnostically useful in patients subject to recurrent canker sores. The condition was reproducible in 6 of the 46 patients with canker sores tested with citric acid and in 4 of the 35 patients tested with acetic acid. Tartaric acid and lactic acid gave negative tests and were not considered of etiological importance. A history of canker sores was much more frequent in allergic patients than in nonallergic control patients. None of the non-allergic patients in the control group had a positive reaction, that is, a canker sore as a result of the test. The utilization of this method of testing in the diagnosis of food allergy in skin-test-negative patients and in drug allergy is indicated.

* Medical Literature Abstracts, J.A.M.A., Feb. 28, 1959, p. 159/991.

WINTER MEETING COMMITTEE

(L. to R.) Dr. Stephen Nachbar, Dr. Jack Thaller, Dr. Nathan Wachtel, Chairman; Dr. Andrew Cannistraci, Co-chairman; Dr. Irving Yudkoff, Dr. Abraham Reiner, and Dr. Rudy Palermo.

Book Reviews

Theory and Practice of Partial Prosthesis, by Vachuda, Josef and Lenk, Rudolf, 2nd revised edition, 480 pages, 620 illustrations and 18 tables, Wilhelm Maudrich Publishers, Vienna, 1954 (in German) $12.00.

This rather complete work on partial prosthesis covers almost every conceivable facet of the subject. The history of removable dentures is traced from antiquity to the present time in a rather long but interesting chapter dealing with, among other things, the development of both tissue and tooth-borne appliances.

The authors devote a considerable amount of space to the theoretical and functional considerations involved in design and construction. Many practical cases are profusely illustrated and while much of this does not concur with our present concepts, it is nonetheless noteworthy.

The technics involved in fabrication, running the gamut from impression taking through the use and handling of materials constitute a laboratory manual.

Of particular interest are the several methods described utilizing endodontically treated roots, sans crowns for retention of the prosthesis. This all inclusive text is so very well illustrated that only a minimum knowledge of German is necessary for its comprehension.

ALEXANDER SOBERMAN

A Search for Man's Sanity, the selected letters of Trigant Burrow, prepared by the editorial committee of the Lifwynn Foundation; 615 pages, index and biographical notes, Oxford University Press, New York, $8.75.

This book is, in a sense, the personal monument and epitaph of a scientist and humanitarian. It is the biographical, autobiographical re-creation of a man's life's work. Trigant Burrow is one of the founders of group analysis. He began these studies formally in 1923, after having practiced psychoanalysis successfully in Baltimore for ten years. Previous to that he had studied with Jung for one year (1909).

Through his letters the man's trials, triumphs and tragedies are recorded, and through them all runs his strengthening conviction in his purpose, and of his belief in the purposefulness of all life. Here is the pageant of a man who finds his work, and who in following it finds a full life. His interests and his friends ranged wide.

Dr. Burrow helped in founding the American Psychoanalytic Association after having pioneered the bringing of psychoanalysis to America from Europe. This did not deter him from deviation from prescribed tenets of psychoanalysis, and finally to take issue with them and their founder, Freud. The tale of this struggle of a man with himself, with others, and its resolution is well told.

The Lifwynn Foundation which Burrow essentially fathered in 1927 was the prime issue of this schism. It is at present continuing in its excellent research, one of whose products is this book. The editors, William E. Galt, Hans Syz and Charles B. Thompson are to be commended.

The range of this correspondence is particularly wide and interesting, including, among others: Sigmund Freud, Carl Jung, Havelock Ellis, Walter B. Cannon, George E. Coghill, John Dewey, Adolf Meyer, Alfred Korzybski, Lance L. Whyte, D. H. Lawrence, Herbert Read, Sherwood Anderson, Leo Stein, and H. L. Mencken.

This work is recommended to all those who are seeking a higher measure of sanity, as well as a greater sense of understanding of human behavior, whether their own or that of patients, or of people at large.

ARTHUR N. YOHAI

Lippincott's Handbook of Dental Practice, Edited by Louis I. Grossman, D.D.S., Dr. Med-dent. J. B. Lippincott Co., Philadelphia 1958. Third Edition, 514 illustrations, 4 color plates.

The third edition of the Handbook of Dental Practice has included a revision and replacement of obsolete information with the most modern advances in all branches of dentistry. At the same time the authors have also presented a thorough consideration of basic procedures and their clinical applications.

"Hypnotism as Applied in Modern Dental Practice" has been included in this edition. It describes in detail this form of anesthesia, together with the indications and contra-indications for its use. Included is a series of actual case reports in which hypnotism has been utilized as a valuable adjunct in dental practice.

New information has replaced the second edition material in the sections devoted to Resinous Restorations, Orthodontics and Practical Denture Construction. The remaining sections have received extensive revisions. In order to more graphically present the various techniques and explanations 130 additional illustrations have been included in the present edition than were found in previous editions.

This stimulating and informative text will serve as a valuable ready reference for the many problems of general dental practice.

Oral Diagnosis, by Donald A. Kerr, D.D.S., M.S., Major M. Ash, Jr., D.D.S., M.S., and H. Dean Millard, D.D.S., M.S. The C. V. Mosby Co., St. Louis, 1959. 212 illustrations. 419 pages, $10.00.

The authors have presented a concept of teaching principles of Oral Diagnosis that is inductive rather than deductive in nature. In deductive instruction the student is taught many facts from which he is expected to single out the important facts necessary and then correctly apply them in order to deduce a diagnosis. In inductive instruction the student is taught to begin with the gathering of particular findings and to work toward an inductive conclusion.

The text follows the following outline:

1. The presentation of the principles for the gathering of information about the patient.
2. The relation of the information to the normal state of the body and to the mechanisms of disease.
3. The presentation of the principles for the formulation of the diagnosis, and
4. The utilization of the information gathered to make a treatment plan for the patient.

The text is well illustrated with clear cut photographs and drawings, printed on glossy paper. The type is large and clear which makes easy reading. This is another fine book on Oral Diagnosis.

A Textbook of Orthodontia, by Robert H. W. Strang, M.D., D.D.S., and Will M. Thompson, Jr., D.D.S., 4th Edition, Lea and Febiger, Philadelphia, 880 pages, 1178 illustration on 647 figures, 5 plates, 2 in Color, 1958, $20.00.

This book is purposely limited to instruction in the use of the Edgewise Arch Mechanism in the treatment of malocclusion of the teeth. The authors present complete and detailed instruction in clinical orthodontia, as well as a sound theoretical background.

Each technical procedure is described clearly, step by step. Such a carefully planned, easy-to-follow presentation enables the reader to assemble the appliance correctly, to adjust the archwires primarily passive, and to incorporate in the archwires the essential modifications for required tooth movements. Emphasis is placed upon the factors which produce stability in the results of treatment.

For this edition Dr. Strang has been joined by Dr. Will M. Thompson. Together they have made a thorough revision of many portions of the text, added a chapter on Clinical Cephalometrics and brought the entire work in line with current advances in this specialty. Every technical description has been tested for accuracy of instruction in teaching, as well as for practical application. The order of procedure in incorporating the various modifications for production of tooth movements is stated specifically. Illustrations of archwire modifications are improved and new ones added.

Teachers, orthodontists, students and dental practitioners alike will find this book organized, clearly written and truly stimulating.

Hemorrhagic Diseases, by Armand J. Quick, Ph.D., M.D., Lea and Febiger, Philadelphia, 451 pages, illustrated, 31 tables, 1957, $9.50.

This sound, informative discussion of hemostasis is a practical guide to the understanding, diagnosis, management and treatment of the many bleeding states encountered in practice. Social implications and the genetic aspects of hemorrhagic diseases are considered fully. Theoretical aspects of coagulation are confined to one chapter, which permits a presentation of the various hemorrhagic diseases purely from the clinical point of view. There are discussions on newly discovered clotting factors and other current developments, on the probable mechanism of the autocatalytic reaction, and on the role of coagulation in relation to hemostasis. Venous thrombosis is considered separately.

Dr. Quick presents 25 laboratory methods for the study and diagnosis of hemorrhagic diseases. Each procedure is described in detail, stating precisely the equipment and reagents needed, and the range of normal control values. The clinical application and interpretation of each test is then discussed critically. Several of the tests were developed in the author's laboratory and tested extensively on a large number of patients with various hemorrhagic diseases. General practitioners, internists, clinical pathologists, medical technologists and clinical chemists will find many reasons for having this book immediately available in office or laboratory.

Molars Away, by Charles E. Heartsill, Exposition Press, New York, 47 pages, 1958, $2.75.

This is an illustrated guidebook containing the titters for wearers of false teeth. The author has been interested in lore about dentures since an aunt told him a hilarious anecdote concerning a false-teeth wearer thirty-five years ago.

The book, aimed particularly for anyone who has just had, or expects soon to have, a "feaft" (full extraction and false teeth), explains techniques for coping with problems that face the wearer of plates. The author, a "feaft" man himself, gives practical tips on such matters as how to eat properly, how to learn to talk without whistling and how to deal with soreness of gums. He also relates incidents that have befallen the unwary wearer and tells how to avoid similar contretemps.

"Molars Away!" is a practical handbook, written in a breezy, humorous style.

Dental Clinics of North America, Symposium on Crown and Bridge Prosthodontics, Vincent R. Trapozzano, D.D.S., Consulting Editor, W. B. Saunders Co., Philadelphia, March, 1959.

Twenty-five contributors have assisted Dr. Trapazzano in writing a symposium on "Crown and Bridge Prosthodontics." This issue of Dental Clinics is an outstanding one for in this one volume are the collected ideas and philosophies of some of the leading specialists in crown and bridge. The reader has, in this one book, the basic ideas of the leaders of this subject in our country.

Diagnosis, mouth preparation and treatment planning are thoroughly discussed. Chapters on periodontics and orthodontics discuss how the dentition and the supporting structures can be prepared prior to crown and bridge procedures. The theory and active construction are discussed in detail in other chapters.

This book is an excellent guide for all practitioners. It is highly recommended reading.

Year Book of Dentistry, (1958-1959) by Stanley D. Tylman, D.D.S., M.S., Donald A. Keys, D.D.S., John W. Knutson, D.D.S., Dr. P. H., Harold J. Noyes, D.D.S., M.D., Hamilton B. G. Robinson, D.D.S., and Carl W. Waldron, M.D., D.D.S., Year Book Publishers, Chicago, 492 pages, 339 illustrations, $6.50, 1959.

The new issue Year Book of Dentistry has once again lived up to its previous editions. This excellent review of the literature of the last year has included scores of significant world-wide advances and has shed important light on the new diagnostic and therapeutic procedures applicable to the type of cases seen most frequently in practice.

The Year Book gives the practitioner an excellent review of the dental literature of the last year. The abstracts in this book are taken from dental journals all over the world, many of which the average practitioner never sees. The material is condensed and only the essentials of each article are printed. This is an excellent way to keep up with all the current literature.

NEW YORK UNIVERSITY

The Department of Graduate and Postgraduate Prosthodontics of New York University College of Dentistry announces a one week course in the "Principles and Practice of Dental Care for Patients with Chronic Disease and Disability" to be held May 18-22, 1959. The course is supported by the United States Office of Vocational Rehabilitation. Fifty federal scholarships are available for tuition, maintenance and travel.

This course is planned to provide intensified training in the rehabilitation care of the elderly, the handicapped, and the chronically ill patient and offers a comprehensive and practical presentation of such care in hospital, home, and office. It consists of lectures, seminars, clinical demonstrations, and practice workshops. The teacher staff includes members of the faculty and professional staff of the New York University Dental and Medical Centers.

For additional information and an application blank write to Director, Postgraduate Division, New York University College of Dentistry, 421 First Avenue, New York 10, N. Y.

GRADUATE SCHOOL OF EDUCATION YESHIVA UNIVERSITY

The Graduate School of Education of Yeshiva University has developed a course of study geared specifically for dental practitioners. It is designed to give them a broad scope and basic insight into the behavioral problems of patients.

Special evening classes in psychology, emotional disturbances and areas of handicaps will lead to a Master of Science degree in Special Education. The curriculum will provide the dentist with the knowledge to cope with patients who present personality and health problems.

Jerry J. Adelson, D.D.S., Adjunct Professor, Department of Special Education and Guidance, will serve as special advisor. For further information write to Dr. Adelson at:

Department of Special Education and Guidance, Yeshiva University Graduate School, 110 West 57th Street, New York 19, New York.

Academy Proceedings

MICHIGAN SECTION

The election of officers of the Michigan Section of the American Academy of Dental Medicine was held on Tuesday, Jan. 13, 1959. The following were inducted into office on that date:

President, Dr. Charles Conat; President-Elect, Dr. O. B. Aubin; Vice President, Dr. Meyer Green; Secretary, Dr. David Collon; Treasurer, Dr. Herman Lifton; Delegate, Dr. Joseph Barkley; Alternate Delegate, Dr. Edward Freimuth.

After the election of officers, a very excellent American Cancer Society film was shown entitled: "Differential Diagnosis of Oral Lesions." Dr. John Shackleford, Head of Oral Surgery, Receiving Hospital, discussed the film and his contribution was a very noteworthy one.

EDWARD G. FREIMUTH, *Alternate Delegate*

NEW MEMBERS ELECTED AT MID-ANNUAL MEETING OF AMERICAN ACADEMY OF DENTAL MEDICINE—DECEMBER 7, 1958

Basson, Leon M.
New York, N. Y.

Buehl, Arthur W.
Clayton, Missouri

Bynum, James W.
Clayton, Missouri

Detamore, Robert J.
New York, N. Y.

Epstein, L. Irving
Buffalo, N. Y.

Foster, James K., Jr.
Washington, D. C.

Grossman, Alexander
Brooklyn, N. Y.

Guttelman, Adeline
Brooklyn, N. Y.

Hoffman, Irving M.
Poughkeepsie, N. Y.

Mangels, James H., Jr.
Kent, Conn.

Massey, Luther M.
Zebulon, No. Carolina

Miller, Barry G.
Charlotte, No. Carolina

Rose, J. Sidney
Auburn, N. Y.

Ruggerio, Anthony C.
Runnemede, N. J.

Ship, Irwin I.
Bethesda, Maryland

Shope, C. Marlin
Middletown, Penna

Silverman, Milton
New York, N. Y.

Simonson, Alan
Woodmere, N. Y.

Stone, Irving C.
Chicago, Illinois

Sussman, Harry L.
Brooklyn, N. Y.

Tackler, Barry
New York, N. Y.

Thorpe, Jacob O.
Charlotte, No. Carolina

Wolfson, Sumner J.
Brookline, Mass.

THE LOSS IS GREAT

DR. DENNIS BARKOFF
Windsor, Ontario
University of Toronto, 1926

DR. GEORGE URSINI
New York, N. Y.
Columbia University, 1919

DR. MAX M. WILLIAMS
Royal Oak, Michigan
University of Michigan, 1918

WINTER MEETING OUTSTANDING SUCCESS

Winter Meeting clinicians—(L. to R.) Maury Massler, D.D.S., Henry M. Goldman, D.M.D., and Lewis Fox, D.D.S.

More than 300 Academy members and friends attended the Winter Meeting of the American Academy of Dental Medicine which was held on Sunday, Dec. 7, 1958 at the Hotel New Yorker, in New York City. For almost three hours, three outstanding clinicians presented their material to a stimulated audience. The success of this meeting can be attributed to these fine clinicians, to Dr. Nathan Wachtel, Chairman of the meeting and to his diligent Committee.

Dr. Maury Massler, Chicago, Ill., Professor and Chairman of the Department of Pedodontics, and Co-ordinator of Clinical Research, College of Dentistry, University of Illinois, discussed in detail "Gingival Morphology and Physiology." Dr. Henry M. Goldman, Boston, Mass., Director of the Riesman Dental Clinic, Beth Israel Hospital; Professor of Periodontology and Chairman of the Department of Periodontology, Graduate School of Medicine, University of Pennsylvania, lectured on "The Behavior of Gingival Tissue in Alterations of Local Environment." The third speaker, Dr. Lewis Fox, South Norwalk, Conn., Associate Clinical Professor of Dentistry, School of Dental and Oral Surgery, Columbia University, Associate Professor of Periodontology, Graduate School of Medicine, University of Pennsylvania, presented his ideas on the "Handling of the Gingival Tissue During Restorative Dental Procedures."

This excellent scientific session was enthusiastically received by the audience of more than three hundred. Special mention should be given to Dr. Nathan Wachtel, Chairman, and to Dr. Andrew Cannistraci, Co-Chairman for the excellent manner in which this meeting was conducted. We can all look forward to future Winter meetings that will be "bigger and better" than ever.

NEW YORK UNIVERSITY COLLEGE OF DENTISTRY GIVES SPANISH LANGUAGE POSTGRADUATE COURSE IN PERIODONTIA AND ORAL MEDICINE.

The Fifth Postgraduate course in Periodontia and Oral Medicine in the Spanish language was completed on March 20th 1959 at New York University College of Dentistry. The four week intensive course, given entirely in the Spanish language, was conducted under the supervision of Dr. Sidney Sorrin, Professor and Chairman of the Department, and assisted by Assistant Professor Anthony F. Posteraro. Drs. Blass, Soberman, Witkin, and Yohai also participated as lecturers.

Dr. Raymond J. Nagle, Dean of the Dental College, which recently moved to its new building at 421 First Avenue at 25th Street, welcomed the students. Dean Nagle told them how proud we were to be the first Dental College to have started such a course five years ago. He spoke most enthusiastically about our desire to continue this splendid teaching relationship between the dentists of our country and those of Latin America. He urged the furtherance of this mutual exchange of friendship between Latin America and the United States.

At the conclusion of the course a luncheon was held at the New York University Club, located at 123 West 43rd Street, at which time certificates for the course in Periodontia and Oral Medicine were issued to the participants.

(Standing, L. to R.) Dr. Gervasio Ricci, Venezuela; Dr. Henry Briones P., Guatemala; Dr. Roberto Giachella, Argentina; Dr. Alejandro Giammattei, Guatemala; and Dr. Jaime Arango, Columbia. (Seated, L. to R.) Dr. Anthony Posteraro, Assistant Professor of Periodontia and Oral Medicine; Dr. Isabel Hernandez, Chile; Dr. G. Zambrano de Ramirez, Venezuela; Dr. Sidney Sorrin, Professor and Chairman of the Department of Periodontia and Oral Medicine; Dr. Maria del Pilar Fernandez, Mexico; and Dr. George J. Witkin, Assistant Professor of Periodontia and Oral Medicine.

Doctors Giammattei, Ricci, Arango and Hernandez are taking the one year full-time course in Periodontia and Oral Medicine.

MASSACHUSETTS SECTION

Officers of the Massachusetts Section. (front row, L. to R.) Dr. Leslie Milne, President-elect; Dr. George Clarke, Past-President; Dr. Earl Stone, President. (top row, L. to R.) Dr. Arthur Gold, Past-President; Dr. Richard Harriott, Secretary-Treasurer and Dr. George Bruns, Past-President.

MASSACHUSETTS SECTION

The Massachusetts Section of the American Academy of Dental Medicine held its Mid-Winter meeting at the Hotel Kenmore in Boston on Sunday, January 18th with President Earl Stone presiding. Sunday meetings, an innovation of Dr. Stone, are proving very popular with the Section.

Dr. Robert I. Diamond, program chairman, built the meeting around the theme, "Evaluation and Management of Cardiac Disease Complicating Dental Therapy." The speakers were: Bernard Tolnick, M.D., Senior Staff Physician of the Boston City Hospital Sanatorium Division, Instructor in Medicine at Boston University School of Medicine, and Instructor at the Medical School of Tufts University; and Richard Calvin Taylor, D.M.D., Professor of Oral Surgery, Chairman of the Department at Tufts University School of Dental Medicine, and Director of Dental Services at the Boston City Hospital.

Dr. Tolnick stressed that history is very important in dealing with the heart patient. We must clarify the degree of decompensation for toleration to surgery. Dr. Tolnick elaborated on the complications and types of cardiac disease. He spoke of the newer medicines and drugs, not only their dosages, uses and results, but their untoward reactions in the cardiac patient in surgery. Elaborating at length on the anti-coagulants, and the antibiotics; the necessity for use, yet the complications involved in using them.

Dr. Taylor spoke from the dentist's viewpoint. He said that dentists are much more pessimistic in dealing with heart patients than is warranted. This in turn raises the anxiety of the patient which could be very grave. Evaluation through history is very essential. Pre-operative sedation is often desirable to calm the tense heart patient. More

important, however, is the calm reassurance of the dentist. Dr. Taylor spoke of emergency drugs that should be handy, stressing the importance of ogygen. He said that readily available oxygen is a must for every dental office.

Dr. Irving Nathanson discussed both papers, and Dr. Robert I. Diamond moderated the question and answer period.

President Earl Stone announced that the Annual Meeting of the Section will be Sunday, May 3rd at the Hotel Statler in Boston. This will be an all-day meeting on "Patient Psychology and Management." There will be election of officers, and Dr. Stone appointed the Nominating Committee: Dr. George F. Clarke, Dr. Arthur Gold, Dr. Arthur Stone, and Dr. Samuel Kane. The Auditing Committee is composed of Dr. Dr. George M. Karp, and Dr. John F. Gallagher, Jr. A new code of by-laws is being drawn for the section by Dr. Leslie Milne, who will present them at this meeting.

RICHARD C. HARRIOTT, *Secretary*

NEW YORK SECTION

Officers of the New York Section for 1958-1959. (Seated, L. to R.) Dr. Fred Romberg, Dr. Celia Dickman, Dr. Stephen Nachbar, Dr. Angelo Cacciatore. (Standing, L. to R.) Dr. Sanford Kirsch, Dr. Seymour Koteen, Dr. Howard Ward and Dr. Henry Greene.

The first annual Spring full-day meeting of the New York Section of the American Academy of Dental Medicine is to become a reality. An opportunity to spend a day in the sun, relaxing on one of New York's most beautiful golf courses, feasting on a delicious full course roast beef dinner, and climaxing the evening with a lecture by one of dentistry's most dynamic speakers, Dr. Irving Glickman. Your committee, co-chairmen Drs. Leonard Nevins and Howard Ward, and Drs. Henry Greene, Sanford Kirsch and Seymour Koteen have been unceasing in their efforts to make this a regal day. Dr. Glickman's seminar is entitled "What the Gingivectomy does for the Gingiva."

The full day meeting will take place on Thursday, May 7, 1959, at the North Hills Golf Club, Douglaston, L. I. Send your reservation in to Dr. Seymour Koteen, Treasurer, 57 W. 57th Street, New York 19, New York. The fee for dinner and Dr. Glickman's seminar, is $7.50 for members and $9.00 for non-members. The green fee is $6.00. Make checks payable to the American Academy of Dental Medicine, New York Section.

The fall meeting of the New York Section was held on October 16, 1958 at the George Washington Hotel. Dr. William Greenhut, National Treasurer and Past President of the Academy, presided over formal installation ceremonies of the officers who had been elected at the spring meeting. The new officers are pictured above.

Inaugurating a new tradition, Dr. Howard Ward, as our President-Elect, presented bronze plaques on behalf of the membership, to some of our past presidents. The men so honored were Drs. Sanford Kirsch, Theodore Lite, Abraham Reiner and Leon Scott.

The highlight of the evening was our speaker, Dr. Austin Kutscher, whose subject was: "The Use of Antibiotics in the Dental Office." A stimulating discussion period followed his excellent presentation.

HENRY I. GREENE, *Section Editor*

Announcements

POSTGRADUATE TRAINING IN PERIODONTIA AND ORAL MEDICINE NEW YORK UNIVERSITY COLLEGE OF DENTISTRY

The following postgraduate courses in Periodontia and Oral Medicine will be offered at the New York University College of Dentistry and will be given by Dr. Sidney Sorrin and associates:

No. 124.02. REFRESHER COURSE IN PERIODONTIA AND ORAL MEDICINE

Ten sessions, Wednesday, 4:00 to 6:00 P.M. February 3, 1960 to April 6, 1960.
Tuition and books. $156.00. Instruments approximately $55.00.

Theoretical and practical application of periodontal diagnosis and techniques to general dentistry. Four lecture and six clinical demonstration sessions. Equilibration of occulsion is performed by the student on casts. Patient demonstrations include equilibration of occulsion, conservative and radical therapy, home care, etc.

No. 123.02. PERIODONTIA AND ORAL MEDICINE IN THE SPANISH LANGUAGE

Four weeks, Monday through Friday, 9:00 A.M. to 4:00 P.M.
March 7 to April 1, 1960 inclusive. Tuition including books and instruments approximately $385.00.

Theoretical and practical application of Periodontia and Oral Medicine is fully explained and demonstrated. Equilibration of occlusion is performed by the student on casts. Lectures and clinical demonstrations of diagnosis and treatment planning, conservative and radical techniques, equilibration of occlusion, home care, etc. The entire course is conducted in the Spanish language.

COMPREHENSIVE PREPARATION IN PERIODONTIA AND ORAL MEDICINE

No. 121.11 One academic year, full time. September 14, 1959 to May 27, 1960.
Tuition $1,010.00. Instruments and books approximately $135.00.

No. 120.11 and 121.11. Two academic years, full time. September 14, 1959 to May 26, 1961.
Tuition $2,020.00 (two years). Instruments and books approximately $231.00.

No. 121.21. Two academic years, half time. September 14, 1959 to May 26, 1961. (Two and one half days weekly.)
Tuition $1,010.00 (two years). Instruments and books approximately $135.00.

No. 120.21 & 121.21 Four academic years, half time. September 14, 1959, to May 1963. (Two and one half days weekly.)
Tuition $2,020.00 (four years). Instruments and books approximately $231.00.

These courses are designed for comprehensive preparation in Periodontia and Oral Medicine and are of particular significance for certification towards specialization. All didactic and clinical phases are covered with the objective of developing expert proficiency.

No. 222. GRADUATE COURSE IN PERIODONTIA AND ORAL MEDICINE.

Two academic years, full or half time, beginning Sept. 14, 1959. Tuition $2,020.00. (two years). Instruments and books approximately $275.00.

This program leads to the degree of Master of Science (in Dentistry). The objectives are to teach superior proficiency in Periodontia and Oral Medicine based on adequate background in the basic sciences.

For further information, write to the Secretary, Postgraduate Studies, New York University College of Dentistry, 421 First Ave., New York, N. Y.

JEWISH CHRONIC DISEASE HOSPITAL, BROOKLYN, N. Y.

Applications are being received for a one year residency in anesthesiology for graduate dentists under Stanley R. Spiro, D.D.S., at the Jewish Chronic Disease Hospital beginning July 1, 1959. Full maintenance and a stipend of $200 per month is provided. Address requests to Joseph J. Obst, D.D.S., Director of Dentistry, Jewish Chronic Disease Hospital, 86 East 49th Street, Brooklyn 3, New York.

THE TENTH ANNUAL BERKSHIRE CONFERENCE

The Division of Graduate and Postgraduate Studies of Tufts University School of Dental Medicine will conduct the Tenth Annual Berkshire Conference in Oral Pathology and Periodontology at Eastover in Lenox, Mass., June 14-18, 1959. The Conference will consist of four days of lectures, seminars and panel discussions regarding the clinical problems by outstanding teachers and clinicians in dentistry, medicine and their related fields.

The curriculum is arranged so that the mornings and evenings are devoted to professional activities with afternoons open for recreation. This is a conference for general practitioners as well as those interested in a specialized practice.

The Central Theme of the Conference will be *"Trauma and Oral Disease."* One of the special features of this Anniversary Conference will be a *Closed Circuit Television* session devoted to a step by step presentation of the technic of occlusal equilibration.

Included among the faculty and subjects to be considered are:

1. DR. JOSEPH L. BERNIER—Armed Forces Institute of Pathology, Washington, D.C.
   Subject: A clinico-pathological seminar devoted to "Trauma in the Causation of Oral Mucous Membrane Disease." In this presentation each participant is assigned a microscope and a set of microscopic slides so that he can participate with Dr. Bernier in correlating the clinical and microscopic features of oral disease.
2. DR. BASIL G. BIBBY—Eastman Dental Dispensary, Rochester, New York.
   Subject: The Oral Bacterial Flora, Its Significance in the Management of Periodontal Disease; Calculus Formation.
3. DR. MILTON B. ENGEL—College of Dentistry, University of Illinois, Chicago, Illinois.
   Subject: The Connective Tissue Ground Substance, Its significance in Disease of the Gingiva and Underlying Tissue.
4. DR. IRVING GLICKMAN — Tufts University School of Dental Medicine, Boston, Massachusetts.
   Subject: Trends in Periodontology During the Last Decade. Pathways for Future Development.
5. DR. BALINT J. ORBAN — Loyola University School of Dentistry, Chicago, Illinois.
   Subject: Trauma and the Periodontium—The Clinical and Experimental Findings on the Role of Trauma in the Causation of Periodontal Disease and the Importance of its Correction in the Eradication of Periodontal Disease.
6. DR. SIGURD P. RAMFJORD—School of Dentistry, University of Michigan, Ann Arbor, Michigan.
   Subject: A Practical Clinical Approach to the Elimination of Occlusal Trauma by Occlusal Equilibration. This will be a closed circuit television presentation. Dr. Ramfjord will present the procedure for equilibrating the occlusion in a step by step manner so that every participant can see it.
7. DR. LOUIS WEINSTEIN — Tufts University School of Medicine, Boston, Mass.
   Subject: The Action of Antibiotics upon Microorganisms, Tissues and the General Welfare of the Patient—Use of Antibiotics for the Management of Special Problems.

For further information and application write to: Tenth Annual Berkshire Conference, Tufts University School of Dental Medicine, 136 Harrison Avenue, Boston 11, Massachusetts.

DEVELOPING EFFECTIVE PRACTICE A MANAGEMENT COURSE AT NEW YORK UNIVERSITY

June 22-26th, 1959

Lectures and participation sessions to teach the dentist and his staff how to motivate patients to accept more effective dental service. Specific training is given for understanding and educating patients and gaining their cooperation. Training the secretary and other components of management are included. Psychological tests to provide better understanding of himself and the reactions of patients are administered to each participant.

Instructors: Dr. J. Lewis Blass and associates.

For information write: Postgraduate Secretary, New York University, College of Dentistry, 421 First Ave., New York City.

HISTOPATHOLOGY STUDY CLUB

January 1 marked the first year of sponsorship of the Histopathology Study Club by the Department of Dentistry of Michael Reese Hospital and Medical Center.

Dr. Balint Orban, Histopathologist for the Study Club, reported a successful year of operation. Monthly case histories were sent to the 110 members, including dentists and dental schools from coast to coast. These case histories, which made up a very interesting series, included microscopic sections, kodachrome 2 x 2 clinical slides, kodachrome 2 x 2 photomicrograms, and clinical X-rays. In addition he reported an effective educational and diagnostic biopsy service to the membership.

According to Dr. Orban the future of the club appears extremely bright. For the next year some very unusual human autopsy material is being prepared. This material will show various periodontal conditions, pockets, calculus, periodontal abscesses in situ with the entire periodontium and surrounding bone. In addition, for the coming year there will also be specimens of the temperomandibular joint, and various interesting lesions of the oral mucous membrane.

At present there are a limited number of memberships available in the Study Club. Anyone interested in participating in this interesting, beneficial and educational effort may write to the Department of Dentistry, Michael Reese Hospital and Medical Center, 29th Street and Ellis Avenue, Chicago 16, Illinois.

COMMITTEE ON INTERNATIONAL INTERCHANGE

Heretofore, federal grants for teaching in other countries were awarded only for periods of 6 months or longer. This made it impossible for most dentists to serve since it is impractical to leave a practice for so long a time. The Department of State has now accepted in principle the request of the American Academy of Dental Medicine to send to dental schools in other countries teams of dentists each of whom will serve 2 months.

Fulbright grant funds will pay the transportation costs of the teachers together with living expenses for him and up to 4 dependents. However, this does not quite cover all costs, as pleasure trips, entertainment and similar expenses are not chargeable to the Government. Courses must be given in the language of the country with some exceptions.

The time of the courses will be determined by the dental school under whose auspices the program is given. South of the Equator, the academic year is often from April to December; in the northern hemisphere, it corresponds to ours with modifications necessitated by climate. Whether the entire teaching group will travel together or go individually to replace each other depends upon the needs of the host country. There is little likelihood of a school disrupting its routine in order to present all courses simultaneously.

After much thought, your committee has tentatively selected the University of San Marcos (the oldest university in the Western Hemisphere) at Lima, Peru for its first venture in 1960. Courses will be offered in Oral Medicine and Treatment Planning, Oral Surgery, Endodontics, Periodontics, Fixed Prosthesis and Occlusal Reconstruction. They will be presented in Spanish and consist of lectures, demonstrations and clinical instruction. We expect this activity to continue. Plans are under consideration for future courses in Japan (in English), Cuba (in Spanish) and perhaps Burma (in English).

The committee is making a list of those available for presenting courses. If you are interested and are a citizen of the United States, send the following information to the committee chairman:

1. Name 2. address 3. subject 4. teaching experience 5. curriculum vitae 6. languages spoken (English is sufficient in some countries) 7. any restrictions of time or place.

Naturally, the more restrictions, the less chance of being chosen. We cannot arrange for everyone to go in July and August when most schools are closed. Remember that it takes more than a year to plan and process a project so send your name promptly.

To dental Faculties in other countries: if you would like your courses in your university by qualified colleagues from the United States, write to Dr. S. Leonard Rosenthal, Chairman, Temple University School of Dentistry, 3223 N. Broad Street, Philadelphia 40, Pa.

NORTHEASTERN SOCIETY OF PERIODONTISTS

The First Annual Meeting of the Northeastern Society of Periodontists will be held on April 10, 1959. This meeting will be held at the New York University College of Dentistry, to be followed by a Luncheon and Symposium at the Gramercy Park Hotel, Lexington Avenue at 21st Street.

The following essayists will participate:

Introductory remarks—Dean Raymond C. Nagle

I Basic Research and its Application

a) Pathogen Population and Natural Resistance to Infection.

Dr. Howard Schneider, Rockefeller Foundation.

Discussor—Dr. Harry Blechman, New York University Dental School.

b) Bacteriology of the Periodontal Disease.

Dr. J. MacDonald, Forsyth Clinic, Boston.

Discussor — Dr. Solon Ellison, Columbia University.

c) Metabolism of Oral Tissues.

Dr. Phillip Person, New York Veterans Hospital.

Discussor—Dr. S. Stahl, New York University Dental School.

II Discusion Luncheon

Chairman—Dr. Harold J. Leonard.

III Symposium: Occlusion, its Affect on the Periodontium.

a) Early Histologic Changes.

Discussor—Dr. Henry Goldman, Boston.

b) Direct Clinical Correlation.

Discussor—Dr. Sidney Sorrin. New York University Dental School.

c) Clinical Changes, Their Measurement and Significance.

Discussor — Dr. Lewis Fox, S. Norwalk, Conn.

Further information may be obtained from Dr. Bernard Wasserman, 730 Fifth Avenue, New York 19, N. Y.

TEMPLE DENTAL ALUMNI

Temple Dental Alumni Day will be held on Wednesday, May 6th, 1959 at Temple University School of Dentistry in Philadelphia. Four postgraduate courses will be presented by members of the Class of 1934. Provisions have been made for the alumni to lunch at the Dental School. The Alumni will honor President Robert L. Johnson for his great accomplishments at Temple. For further information contact, Dr. Royal Popper, 5605 N. Park Avenue, Philadelphia 41, Pa.

FEDERATION DENTAIRE INTERNATIONALE

The Federation Dentaire Internationale is a Federation of approximately 50 national dental associations. The American Dental Association is the largest single section.

Supporting Members. Individual members of such national associations may become supporting members of the F.D.I. All members of the American Dental Association desiring such membership are requested to contact the National Treasurer for the U.S.A.

Dues. The annual dues for F.D.I. supporting membership for 1959 are $15.00. By returning to the National Treasurer the application blank together with your remittance for the 1959 dues, you will become a member of the Federation and be listed to receive all publications of the F.D.I.

Membership Includes:

1. F.D.I. membership card
2. Certificate of Membership, suitable for framing.
3. Subscription to the International Dental Journal (Quarterly).
4. Subscription to the F.D.I. News Letter (Quarterly).
5. Recognition on registration fee at any annual meeting or quinquennial congress of the Federation.
6. Annual publication of list of F.D.I. members in all countries through the International Dental Journal.
7. Assistance of F.D.I. Travel Consultant, Dr. C. W. Carrick, Oberlin Bank Building, Oberlin, Ohio, in planning your attendance at foreign dental meetings.

Annual Meeting. The 1959 annual meeting of the F.D.I. will be held in New York City, September 12-19 in conjunction with the 100th Anniversary meeting of the American Dental Association. This affords you a fine opportunity of attending an annual meeting of the Federation Dentaire Internationale.

For further information please contact: DR. O. H. MOEN, F.D.I. National Treasurer (United States), 6 Main Street, Watertown, Wisconsin.

Application for Membership

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I wish to become a supporting Member of the Federation Dentaire Internationale and subscribe to the International Dental Journal.

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U. S. National Treasurer
6 Main Street, Watertown, Wisconsin, U. S. A.

THE AMERICAN INSTITUTE OF DENTAL MEDICINE

The 16th Annual Meeting of The American Institute of Dental Medicine will be held in Palm Springs, California, November 8-12, 1959.

Dr. Franz Alexander, Director of the Psychiatric and Psychosomatic Research Institute of Mount Sinai Hospital in Los Angeles, will discuss responses to fear and other emotional stress situations as they occur in life, with special reference to emotional factors in chronic diseases.

Dr. Hermann Becks, the President of the Institute, will report on dentistry and dental research as it is in Europe today.

Dr. Douglas Gordon Campbell will lecture on the personal factors involved in malpractice suits; the psychopathology of nutrition; and personal hazards of dentistry.

Dr. Thomas K. Cureton, Professor of Physical Education and Director of the Physical Fitness Research Laboratory at the University of Illinois will give good information to the practitioner regarding basic principles of physical fitness and methods of improving and maintaining good health.

Dr. Marie U. Nylen, from the National Institute of Dental Research, Bethesda, Maryland, will describe her work with electron microscopic studies with dentinogenesis, amelogenesis, and calcification.

Dr. Max Sadove, Professor of Surgery (Anesthesiology) at the Research and Educational Hospitals of the University of Illinois, will "continue where he left off" two years ago in the field of anesthesiology and the applied aspects of pharmacology.

Dr. Reidar F. Sognnaes, Assistant Dean of the Harvard School of Dental Medicine, will present material concerning dental erosion, cornification and desquamation of oral mucosa, and mineralization, demineralization, and remineralization.

Dr. Stafford L. Warren, Dean of the School of Medicine of the University of California at Los Angeles, will discuss the effects of radioactive fallout on the human body and describe the formation of fallout, treatment, precautions, and therapeutic doses.

The American Institute of Dental Medicine Changes Name

The growing demand and the great emphasis in the teaching areas of the basic sciences led to the establishment in 1954 of a Division of Oral Biology at the University of California which includes the Sections of Oral Histology, Oral Pathology, Oral Medicine, and Oral Diagnosis. From the increasing demand for post graduate education in the borderline fields of dentistry and medicine and the health sciences, it appears that the name of the American Institute of Dental Medicine is not all inclusive. At a recent meeting of The Board of Directors the name was therefore changed to:

The American Institute of Oral Biology

It will be known as such as of July 1, 1959.

DENTAL HEALTH EDUCATION IN RELATION TO PRACTICE MANAGEMENT

Sponsor: Oral Hygiene Committee of Greater New York

Date: Sunday, May 3, 1959

Time: 10:00 A.M. to 3:00 P.M.

Place: Hotel Statler, New York

Speakers:

1. Dr. Irving Shapiro, Assistant Professor of Health Education, Columbia University, School of Public Health; Director of Health Education Division of H.I.P.

He will present methods for disseminating information on creating interest in Dental Health. Specific methods will be discussed and evaluated to show the dentist how education may be carried out in dealing with groups in the community, and at Parent-Teacher meetings.

2. Dr. Frances A. Stoll, Professor of Dental Hygiene, Columbia University, School of Dentistry.

She will present techniques for motivation of Interest in Dental Health among school children. It will include a discussion of the role of the dentist and hygienist in the education of school children and in their motivation to greater appreciation of dental health and their role in maintaining it.

3. Dr. J. Lewis Blass, Professor of Periodontia and Oral Medicine, New York University, College of Dentistry.

He will present practical applications of Dental Health education for the dentist to use with patients. These are intended to provide more personal satisfaction in the practice of Dentistry, and create greater cooperation on the part of the patient and should lead to greater financial rewards. The dentist's application of the techniques of the three speakers will enable him to follow through on methods used in the community and the school and obtain better results from his own efforts in the education of patients.

The basic aim of the day's work will be to explore means for getting the patient to accept more of the dentist's services and to gain his cooperation in achieving and maintaining dental health.

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